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EDITED BY JOHN T. CARRINGTON, F.L.S.

WITH THE ASSISTANCE OF

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"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

POPE's 'Homer.'

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"Nature is a mine of pleasure,—new, boundless, and inexhaustible."

"The naturalist sees life where other men see naught: the woods, the mountain's side, the opening glades, and shadowy burns,—where dwell the new-born butterfly, the gnat, the speckled moth, and the smallest fly; all to him are so many peopled worlds, with customs, habits, and language, of which he alone has the master key."

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- AGER, F. W., 187
ALDERSON, Mrs., 233
ANDERSON, JOSEPH, jun., 120, 182, 238
ARGENT, W. J., 234
ATMORE, EDWARD A., 9, 115, 197, 271
- BARNARD, GEORGE, 239
BAYLEY, ELEANOR, 48
BECHER, Capt. E. F., R.A., 241
BENSON, E. F., 90, 210
BEVERIDGE, W. W. O., 256
BEVIS, J. L., 135
BIGGS, C. J., 163, 262
BIGNELL, G. C., 69, 166, 214, 263
BIRD, G. W., 212
BLABER, W. H., 284
BLANDFORD, W. F., 45
BLOOMFIELD, Rev. E. N., M.A., 41
BODEN, CHARLES, 186
BRABON, G. F., 259
BRIDGMAN, J. B., F.L.S., 33, 49, 100,
155, 225, 251
BUCKELL, F. J., 186, 234
BUCKELL, W. R., 113
BULL, H. E. U., 259
BURRY, R. G., 167
- CAMPBELL, W. HOWARD, 261
CAPRON, EDWARD, M.D., 230, 240
CARRINGTON, JOHN T., F.L.S., 1, 85,
124, 160, 187, 236
CARTER, A. E. J., 161, 235
CHRISTY, REGINALD W., 42
CHRISTY, ROBERT MILLER, 145, 177
COCKERELL, T. D. A., 233
COLES, F., 264
CONQUEST, HAROLD, 114
COTGROVE, J. V., 253
COVERDALE, GEORGE, 116, 195, 219
- DALE, C. W., 93
DOBSON, H. T., 204
DURRANT, HARTLEY-, Jno., 235
DUTTON, R., 207
DYNES, J. A., 135
- EDWARDS, W., 210, 211
EEDLE, THOS., 186
ELISHA, GEORGE, 243
EVERSHED, J., jun., 236
- FITCH, E. A., F.L.S., 33, 64, 89, 100,
155, 166, 190, 225, 259
FOWLER, Rev. W. W., M.A., F.L.S., 4,
55, 77, 283, 286
FREER, R., 260
FROHAWK, F. W., 43
FROST, J., 285
FRYER, H. FORTESCUE, 17
- GARDNER, W., 136, 258
GELDART, W. M., 278
GODWIN, F., 287
GOSSE, P. H., F.R.S., 42
GRIFFITH, A. F., 60
- HALL, C. G., 14, 23
HARDING, H. J., 127
HARDING, MARTIN J., 41, 253, 257
HARMER, G. R., 19
HARPER, W. J., 210
HARRIS, HAROLD A., 62
HERVEY, Rev. A. C., M.A., 23, 42
HILL, JOHN, 264
HINCHCLIFFE, JAMES, 47
HODGKINSON, J. B., 213
HUDSON, G. VERNON, 39, 71, 94, 215, 217
HUTCHINSON, H. T., 261
- INCHBALD, P., F.L.S., F.Z.S., 193, 285
- JENKYNs, M. S., 14, 23
JENNER, J. H. A., 211, 216
JOBSON, H., sen., 112, 117, 185, 211,
234, 283
JONES, A. H., 13
JONES, E. H., 121, 135
- KANE, W. F. DE V., 52, 124, 167
KING, J. J., 136
KINGSFORD, CLARA, 69
KIRBY, W. F., 122
- LANG, H. C., M.D., F.L.S., 281
LIVETT, H. W., M.D., 44
LOWE, Rev. F. E., 135
- MACHIN, WM., 18, 64, 92, 164
MARSTON, PRIORS, 108
McDONALD, G. L., 263
McRAE, W., 187, 188, 201, 235, 250

MELDOLA, R., F.C.S., F.R.A.S., 236
 MELDRUM, THOMAS, 236
 MELVILL, J. COSMO, F.L.S., 15
 MILES, W. H., 288
 MITCHELL, H. T., 284
 MUNDIL, JOHN, 235

 NORRIS, HERBERT E., 24, 200, 282
 NORTHCOTE, A. B., 240

 OLLIFF, A. SIDNEY, 1, 97

 PARRY, Major G. S., R.A., 279
 PARSONS, W. E., 261
 PASKELL, W., 230, 234
 PEARCE, W. T., 92
 PERKINS, V. R., 60, 93, 213, 249
 PHIPPS, M., 90
 PORRITT, G. T., F.L.S., 46, 63, 91, 188, 212
 POWER, J. A., M.D., 95
 PRATT, D., 168, 260
 PREST, W., 161, 254, 273

 RAYNOR, GILBERT HENRY, 16
 REID, WILLIAM, 62
 RENDALL, P. J., 112
 RICKETTS, M., 113
 RIDING, W. S., B.A., M.D., 246
 ROEBUCK, W. D., F.L.S., 71
 ROGERS, H., 46
 ROLFE, R. ALLEN, 29
 ROMANIS, ROBERT, 214
 ROSE, ARTHUR J., 151, 223
 RUSS, PERCY H., 135, 256

SABINE, E., 282, 284
 SAKER, A., 162
 SANG, J., 257, 262, 263
 SCHWARZ, E. A., 165
 SCOTT, WALTER, 114
 SHUTE, G., jun., 261
 SICH, ALFRED, 42, 164
 SIDEBOTHAM, JOSEPH, 284
 SLADEN, Rev. C. A., M.A., 209
 SPILLER, A. J., 118
 SOTHEBY, Miss R. M., 21, 258
 SOUTH, RICHARD, 26, 73, 91, 265
 ST. JOHN, Rev. J. SEYMOUR, 188
 SWINTON, A. H., 187

TARBAT, J. E., 232
 TERO, C. K., 44
 THORNEWILL, Rev. C. F., M.A., 184
 TOMLIN, B., 162
 TUGWELL, W. H., 62, 116, 163

WALKER, F., 211
 WALKER, SAMUEL, 211
 WALROND, F. A., 13
 WATCHURST, P., 19, 284
 WATKINS, W., 46
 WATSON, E. Y., 237
 WEIR, J. JENNER, F.L.S., F.Z.S., 18, 169
 WHINSTONE, J. P., 183
 WHITE, F. BUCHANAN, M.D., F.L.S., 213
 WILSON, OWEN S., 15, 48, 61
 WRIGHT, W. H., 81, 136, 206, 274
 WRIGHT, W. T., 188, 234

ALPHABETICAL LIST OF SUBJECTS.

Abbot's Wood, in, 183, 184
 Abnormities in butterflies, 257
 Abraxas ulmata at Lewes, 211; distribution of, 236, 261, 284
 Acherontia atropos, odour emitted by, 14; near Edinburgh, 235; near Southampton, 259
 Acidalia contiguaria and A. degeneraria, 17
 Acipitilia baliodactylus = tridactylus (fig.), 26; pentadactylus = tridactyla (fig.), 26; spilodactylus = obsoletus (fig.), 28
 Acontia luctuosa, 233
 Acronycta alni, 209; psi, parasite on larva of, 69; strigosa at Mepal, 62
 Echmia dentella near Croydon, 92
 Anerastia farrella, 272
 Agdistis bennettii (fig.), 27
 Agrothereutes, 156
 Alucita hexadactyla = polydac. (fig.), 74
 Anarta melaleuca in Scotland, 45
 Andricus amenti, 30; quadrilineatus, 30

Apanteles fraternus, 166; glomeratus, extraordinary number infesting Pieris brassicae, 263
 Aphilothrix albopunctata, 31; globuli, 31
 Aptesis, 157
 Arge galathea, variety of, 210
 Argynnis dia, Tunbridge Wells, 41; at Epping, 112; lathonia at Dover, 282
 Argyresthia glaucinella near Leicester, 262
 Asilus crabroniformis, 93
 Aspilates strigillaria, 161

 Bees, early, 93
 BERKSHIRE :—
 Deilephila livornica in, 211
 Maidenhead, Lepidoptera near, 281
 Newbury, Lepidoptera at, 209
 Bohemannia quadrimaculella in Norfolk in 1882, 115
 Boletobia fuliginaria, 168
 Bombyx quercus, new food-plant for, 15, 135; retarded pupation of, 44

BOOKS REVIEWED :—

- 'Catalogue of British Coleoptera,' by
Rev. W. W. Fowler and Rev. A.
Mathews, 95
- 'Insects injurious to Fruit,' by Wm.
Saunders, 190
- Brephos notha in the Ongar Park
Woods, 114
- British v. European Lepidoptera, 108
- Callimorpha dominula, variety (fig.), 1
- Calosoma sycophanta, 233
- CAMBRIDGESHIRE :—
- Mepal, Acronycta strigosa, 62
- Pieris daplidice in, 60, 112
- Cannibalism in Pieris crataegi, 15
- Carpophilus assimilis, 97
- Carrington, presentation to Mr. J. T., 274
- Catalytus, 155
- Catoptria pupillana, 269
- Cecidomyia betulæ, 193; cardaminis,
194; rosaria, 193
- Cecidonomus, 155
- Celæna haworthii, larva described, 261
- Ceram, new Coleoptera from, 97
- Cerambyx cerdo at Deal, 23
- Cerataphis lataniae on orchids at
Chichester, 120
- Channel Islands, Lepidoptera of, 42
- Charis zabua, 42
- Chelonia plantaginis, on rearing, 113
- Chilo phragmitellus, larva described, 63
- Chlorogaster ruficeps, 40
- Choreutes scintillulana, 11
- Cidaria sagittata in Bewdley Forest, 211
- Cirrhœdia xerampelina, variety of, 236
- Coleophora salinella, 18
- Coleoptera, localities of British; see
Localities
- Colias edusa in Essex, 41; in Notts,
233; in Gloucestershire, 233; in
Sussex, 238, 258; in Warwickshire,
258; in Isle of Wight, 258; in
Hampshire, 259; in Essex, 259; in
Surrey, 281; in Devonshire, 283;
helice, 159
- Collix sparsata, 20
- Colour of Lepidoptera, variations in, 169
- CORNWALL :—
- Diurni in, 90
- Emus hirtus near Redruth, 119
- Hesperia actæon in, 210
- Correction, Lomaspilis for Heliothis,
190; Nyctemera annulata, 71
- Cosmopteryx lienigiella in Norfolk in
1882, 115
- Crambus myellus in Glen Tilt, 213
- Cremnodes, 156
- Crymodes exulis, 237
- Cryptidæ, 33; list of British, 34, 100,
155, 225
- Cryptoblabes bistrigella, 115; in Norfolk
in 1882, 115
- Cryptorrhynchus lapathi, 214, 264

- Cucullia absinthii in Somerset, 44
- Cymatophora flavicornis, anomalous
pupa, 113, 136
- Cynips kollari, 31, 32
- Cyrtocryptus, 37
- Dasyampa rubiginea near Salisbury, 114
- Deilephila euphorbiæ, 233; livornica in
Essex, 187; at Walthamstow, 210;
in Berks, 211; in Surrey, 234; in
Sussex, 284
- Deiopeia pulchella, 233
- DEVONSHIRE :—
- Colias edusa in, 283
- Morthoe, a month at, 246
- Polia nigrocincta, 248
- Dianthœcia cæsia, 53
- Diptera, students of, wanted, 24
- Dipterous miner in ground ivy leaf, 285
- Diurni in Cornwall, 90
- Dogwood flowers, captures at, 186
- Doubleday Collection at Bethnal Green,
264
- Drosophila fenestrarum, 194
- Dryophanta longiventris, 30
- Dytiscus marginalis, peculiar mistake
of, 263, 286
- Ebulea stachydalis in Isle of Wight, 46
- Elachista (new species ?), 263
- Ellopia fasciaria, 16
- Emmelesia teniata in Ireland, 134
- Emus hirtus near Redruth, 119
- Endromis versicolor, early breeding, 62
- Ennomos autumnaria at Dover, 284
- Entomological Society, of London,
fiftieth anniversary, 139; Hag-
gerston, 167; East London, 168;
South London, 189, 288; West
London, 287
- Ephippiphora nigricostana in May, 164
- Epione vespertaria, 188; variety of, 211
- Epping Forest preserved for the people,
89
- Epunda lutulenta var. lunibergensis in
Ireland, 134
- Erastria venustula, food-plant of larva,
114, 136, 163, 164; cannibal, 163
- ESSEX :—
- Chærocampa celerio in, 260
- Colias edusa in, 41, 259
- Deilephila livornica in, 187
- Epping, Argynnis dia, 112
- Epping Forest, Macro-Lepidoptera in
July, 151; preserved to the people,
89; Tortrices, 164
- Loughton, sallows, 117
- Ongar Park Woods, Brephos notha, 114
- Walthamstow, Deilephila livornica,
210; Sphinx convolvuli, 283
- Eubolia palumbaria, variety, 188
- Eupithecia pygmaea, 10, 199; togata
in Wiltshire, 210
- European Lepidoptera, v. British, 108

- Euthemonia russula*, 188
Exorista chelonæ reared from larva of *C. caja*, 195
 Flowers, insects in their relation to, 145, 177
 Gibraltar, notes from, 241, 279
 GLOUCESTERSHIRE :—
 Colias edusa in, 233
 Wotton-under-Edge, notes, 60, 249
 Wye Valley, insects in, 230
Gracilaria syringella, variety, 262
Grapholitha cæcana, a *Tortrix* new to Britain, 195
Gyrinus natator at light, 233
Halias quercana, 233
 HAMPSHIRE :—
 Acherontia atropos in, 259
 Bournemouth, notes from, 201
 Colias edusa in, 259
 New Forest, collecting in, season bad, 232; in July, 185; season bad, 204, 206
 Sphinx convolvuli in, 235
 Winchester, *Lepidoptera* near, 162
Heliothis armigera, larva and yellow flowers, 23
Hemerobius, abundance of, 284
Hemideina, note on the genus, 49
Hemimachus, note on the genus, 49
Hemiteles, 49, 100; hosts of, 106
Hepialus lupulinus, variety of, 162, 187; velleda in Somerset, 188; note on occurrence of, 236
Hermaphrodite Orgyia pudibunda, 135; *Odonestis potatoria*, 188
 HERTFORDSHIRE :—
 Sphinx convolvuli in, 235
 Heusimene fimbriana, 198, 244
Holoparamesus, the coleopterous genus, 1; *depressus*, 2; *caularum*, 3; *singularis*, 3
 Honeysuckle, visitors to, 209
 Hosts of genus *Hemiteles*, table of, 106
 HUNTINGDONSHIRE :—
 Vanessa atalanta in, 282
Hydrilla palustris at Cambridge, 60
 Hymenopterous parasites, supplementary list of, 64
Hyperacmus crassicornis, 240
Ichneumon, prolonged existence in pupa, 188; New Zealand, note on, 215
Ichneumonidæ, introductory papers on, 33, 100, 155, 225
 Insects in their relation to flowers, 145, 177
 Insect-life in 1883, observations on, 193
 IRELAND :—
 Emmelesia tæniata, 134
 Epunda lutulenta var. *lunibergensis*, 134
 Plusia interrogationis, 133
 Sligo Co., *Lepidoptera* in, 256; notes on season 1882 in, 132; *Plusia bractea* in, 256
 Ulster, report on Entomology in, 124
 ISLE OF WIGHT :—
 Ventnor, notes, 269
 KENT :—
 Bromley, notes round, 19
 Deal, *Cerambyx cerdo*, 23
 Dover, a visit to, 219; *Argynnis lathonia* at, 282; *Ennomos autumnaria* at, 284
 Past and present, notes on, 233
 Tortrices in, 164
 Tunbridge Wells, *Argynnis dia* near, 41
 Vanessa cardui in, 186
 Killing *Lepidoptera*, 240
 Lace-wings, 259
 LANCASHIRE :—
 Phlæodes immundana in, 213
 Preston, *Abraxas ulmata* near, 261
 Witherslack, a week at, 223
 Larvæ, lepidopterous, and yellow flowers, 23; of *Petasia nubeculosa*, description, 46; remarks on rearing lepidopterous, in confinement, 47; of *Chilo phragmitellus*, description, 63; of *Miana strigilis*, description, 91; of British *Pterophori*, 91; abnormal, of *Melanippe montanata* (fig.), 121; of *Phycis adornatella*, description, 212
Lasiocampa ilicifolia from Cannock Chase, 269
Lasiodactylus notabilis, 98; *stelidotoides* (fig.), 99
 LEICESTERSHIRE :—
 Argyresthia glaucinella near Leicester, 262
Lepidoptera, introductory papers on, No. XIX., 122
 Life-history of *Nyctemera annulata*, 39
Limneria brischkei, 69; *rufa*, 69
Linoceras, 36
Lobophora sexalata, 160
 Localities, natural, of Brit. *Coleoptera* :—
 No. XI., bark and wood, 4
 No. XII., general beating and sweeping, 55
 No. XIII., moors and mountains, 77
Lycana acis in Sussex, 135; at Tenby, in South Wales, 210; *bætica*, 13
Macroglossa bombylifformis, 209
Melanippe montanata, abnormal larva of (fig.), 121; *subtristata*, curiously marked, 161
Melitæa artemis, 14; *athalia*, 83
Mesostenus, 37
Miana strigilis, larva of, description, 91

MIDDLESEX :—

Coccyx splendidulana in, 266

Larvæ abundant in, 266; & notes, 266

Mimæseoptilus phædoactylus = *lunædactylus*, 75

Mixodia rubiginosana, &c., in Norfolk in 1882, 115; near York, 254

MONTGOMERYSHIRE :—

Insects in Wye Valley, 230

Mutilla rufipes, 92

Natal, collecting at, 118

Nematopodius, 38

Nematus croceus, 193

Neuroterus lenticularis, 30; *numismatis*, 30

New Zealand, *ichneumon*, note on, 215; life-history of *Vanessa gonerilla*, 217

Nitidulidæ, description of three new species from Ceram, 97

Nonagria elymi, 20; *fulva*, larva, description, 261

NORFOLK, WEST :—

Captures in, 19, 271

Lepidoptera plentiful in, 197

Mixodia rubiginosa, &c., in, 115

Sallows, 198

Season in, notes and captures of, 9

North of England, Lepidoptera in, 161

Notodonta chaonia, 90; *trepida*, 209

NOTTINGHAMSHIRE :—

Colias edusa in, 233

Sphinx convolvuli at Nottingham, 234

Nyctemera annulata, 39; parasite on, 39; correction, 71

Nymphalidæ, 122

Nymphalinæ, 122

Oak-galls at Kew, 29

OBITUARY :—

Benjamin Cooke, 71

Philipp Christoph Zeller, 120

Odonestis potatoria, abundance, 162; hermaphrodite, 188

Odour emitted by *Acherontia atropos*, 14

Enectra pilleriana, food of, 269

Oncocera abenella, 221

Oresbius, 157

Orygia pudibunda, hermaphrodite, 135

Orthopelma, 155

Oviposition by *Triphæna pronuba*, curious site for, 262

Oxyptilus teuerii (fig.), 73, 200

Parasites, hymenopterous, supplementary list of, 64; on the larva of *Acronycta psi*, 69; parasitic beetles, 77

Petasia nubeculosa, larva described, 46

Pezomachus, 49, 225

Phleodes immundana in Lancashire, 213

Phorodesma bajularia, 19

Phosphænus hemipterus, reappearance of, at Lewes, 216

Phycis adornatella, larva described, 212

Phytomyza affinis reared, 195; plantaginis, mines of, 195; glechomæ, 285

Pieris brassicæ, larvæ at Christmas, 42; infested by extraordinary number of *Apanteles glomeratus*, 263

Pieris cratægi, cannibalism in, 15; daplidice in Cambridgeshire, 60, 112

Pimpla spuria, 251

Plusia interrogationis in Ireland, 133; bractea in Sligo, 256

Polia nigrocincta in Devon, 248

Psila rosæ, 194

Pseudoterpna cytisaria, 233

Pterophori, contributions to the history of British (plates), 26, 73; larvæ of British, 91

Pupa, anomalous, of *Cymatophora flavicornis*, 113, 136

Pyrodes rhediana in May, 164

Queensland, scarcity of Lepidoptera, 238

Ragwort bloom, visitors to, 167

Reminiscences, entomological, 127

Retarded emergence of *Sph. ligustri*, 187

Retinia turionana, 164; in May, 164

Rhogas reticulator, 69

Sallows, 85; at Loughton, 117

Saturnia carpini, variety of larva of, 261

Satyrus janira, variety, 13; hyperanthus, 188; *tithonus*, variety, 234

Scarcity of Lepidoptera, causes of, 52; of Lepidoptera, 201, 253

Schranksia turfosalis, 11

SCOTLAND :—

Aberdeen, *Sphinx convolvuli* in, 235

Anarta melaleuca, supposed occurrence of, 45

Edinburgh, *Acherontia atropos* near, 235; Lepidoptera near, 161

Glen Tilt, *Crambus myellus* in, 213

Melrose, Lepidoptera near, 254

Scotosia dubitata, 233

Season in West Norfolk, 9; notes on the past, 23; 1882, notes on, 81;

1882, notes on, in Co. Sligo, 132;

notes on, 186; in West Norfolk,

notes on, 197; 1883, notes on early

part, 204; note on, 230; notes on,

from Croydon and elsewhere, 276;

notes and observations on the past,

265; further notes on, 271

Senta ulvæ, abundance of, 212

Sesia bembeciformis, 238

SHETLAND ISLES :—

Unst, Lepidoptera of, 236

SHROPSHIRE :—

Shrewsbury, notes from, 253

Smerinthus populi, duration of pupal stage in, 234

Solenobia inconspicuella at Clapham, 166

SOMERSET :—

Cucullia absinthii, 44

Hepialus velleda, 188

Lepidoptera in, 44

Spathegaster aprilius, 30

Sphinx pinastri, 187; ligustri, retarded emergence of, 187, 234; convolvuli, 283; at Nottingham, 234; in Herts, 235; in Hants, 235; in Aberdeen, 235; at Walthamstow, 283

Spring notes, 116

STAFFORDSHIRE :—

Cannock Chase, Lasiocampa ilicifolia from, 260

Stauropus fagi, breeding, 211

Stibentes, 156

Students of Diptera, wanted, 24

Sugaring, natural, 239

SURREY :—

Clapham, Solenobia inconspicua, 116

Collecting in, 160

Croydon, Æchmia dentella near, 92; Lepidoptera near, 43; notes on the season from, 276

Deilephila livornica in, 234

New Malden, season good, 204

Notes from, 237

Shere, aculeate Hymenoptera scarce, 230

SUSSEX :—

Brighton, Synia maculosa, 261

Chichester, additional notes from, 238; Cerataphis lataniae, 120; entomological notes from, 182

Deilephila livornica in, 284

Eastbourne, Colias edusa, 258

Lepidoptera in, 21

Lewes, Abraxas ulmata, 211; reappearance of Phosphæus hemipterus, 216

Lycæna acis in, 135

Synia musculosa at Brighton, 261

Tæniocampa leucographa, 209

Termites of Rangoon, Termes taprobanes, 214

Tethea retusa, 209

Thaumatotypus, 159

Thecla rubi, 135

Theroscopus, 158

Tinagma resplendella in Norfolk in 1882, 115

Tinea pallescentella, 64

Tineina bred and captured in 1883, 243

Tortrices in May, 164; bred and captured in 1883, 243

Tortrix lafauryana, 11

Tortrix new to Britain (Grapholitha cæcana), 195

Trichoptera, new species of, 138

Triphæna pronuba, curious site for oviposition, 262

Ulster, report on Entomology of certain districts in, 124

Vanessa urticae, 13; c-album in North Wales, 41; cardui in Kent, 186; gonerilla, life-history of, 217; atalanta in Huntingdonshire, 282

Variations in the colour of Lepidoptera, 169

Variety of Hepialus lupulinus, 162, 187; of Eubolia palumbaria, 188; of Arge galathea, 210; of Epione vespertaria, 211; of Satyrus tithonus, &c., 234; of Cirrhœdia xerampelina, 236; of larva of Saturnia carpini, 261; of Gracilaria syringella, 262

WALES, NORTH :—

Carmarthenshire, Lepidoptera in, 61

Notes from, 253

Vanessa c-album in, 41

WALES, SOUTH :—

Tenby, Lycæna acis at, 210

WARWICKSHIRE :—

Colias edusa in, 258

Wasp in winter, 48

WIGHT, ISLE OF :—

Colias edusa in, 258

Ebulea stachydalis in, 46

WILTSHIRE :—

Eupithecia togata in, 210

Salisbury, Dasyampa rubiginea near, 114

WORCESTERSHIRE :—

Bewdley, captures at, 257

Bewdley Forest, Cidaria sagittata in, 211

Xylina semibrunnea, 23; petrificata, 44, 134

YORKSHIRE :—

List of Lepidoptera, 71

Notes from, 207

York, Mixodia rubiginosana from, 254; notes from, 254

Zygæna eboracæ, 273

Ypsipetes elutata, 18, 47, 62

Zygæna, new form in the genus, 273

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CALLIMORPHA DOMINULA.



CALLIMORPHA DOMINULA (variety).

THE very fine variety of *Callimorpha dominula* figured above was captured by Mr. M. Ricketts, of Bouverie House, Folkestone, on the 6th July, 1882, at St. Margaret's Bay, near Dover. It was observed from some distance as differing from the normal type, which was flying about in large numbers.

The colours, as will be seen from the woodcut, have become suffused in a remarkable manner, forming one of the most beautiful varieties which have as yet come under our notice.

JOHN T. CARRINGTON.

ON THE COLEOPTEROUS GENUS *HOLOPARAMECUS*, CURTIS.

WITH DESCRIPTIONS OF THREE SPECIES OCCURRING IN BRITAIN.

BY A. SIDNEY OLLIFF.

IN 1845 Professor Westwood called attention (Trans. Ent. Soc., Lond., vol. iv., p. 236) to the fact that the antennæ of some of the species of *Holoparamecus* varied in the number of joints. At the same time he suggested that this variation was sexual.

M. Victor Motschulsky has since pointed out (Bull. Soc. Imp. Nat., Moscou, 1867, p. 98) that the males of some of the species have the antennæ 9- and the females 10-jointed, whereas in other species both sexes have the antennæ 11-jointed; upon these characters he divides the species into two genera, adopting the name *Holoparamecus* for those having the antennæ composed of nine or ten joints, and *Calyptribium* for those with eleven; he also states that *H. singularis*, Beck., and *H. depressus*, Curtis, are not synonymous. After carefully examining a great number of specimens from various localities, I have come to the conclusion that they are really distinct species; and, having at my disposal examples of both these insects, I thought it would be interesting to publish descriptions of them, so that collectors may recognise the two, if they are so fortunate as to possess them.

I have also described a species which has not hitherto been recorded as British, and which appears on the Continent to be an uncommon insect.

SECTION A.—Antennæ 9-jointed in male, and 10-jointed in female (*Holoparamecus*).

HOLOPARAMECUS DEPRESSUS, Curtis.

Male.—Pale reddish testaceous, elongate and subdepressed, rather shiny, very sparingly clothed with fine silky pubescence. Head small, rounded in front, and covered with minute close punctures. Eyes rather large and convex. Antennæ 9-jointed; basal joint short and stout, second and third long and slender, fourth to sixth small and subglobose, seventh a little larger than the preceding, the eight and ninth forming an abrupt ovate club, of which the apical joint is slightly the smaller. Prothorax broader than long, moderately constricted behind, the posterior angles elevated; with a deep fovea upon its disc; marked at the base with two transverse lines, of which the anterior is bisinuate; these transverse lines are joined in the centre by a little impression, and on each side by a longitudinal furrow, commencing at the base. Elytra considerably broader than prothorax at the base, with irregular rows of rather coarse punctures; humeral prominences small, but distinctly visible; sutural stria commencing at the base, but effaced posteriorly; each elytron with a very indistinct oblique impressed line, running from the shoulder to the apex. Length, $1-1\frac{1}{4}$ mm.

Female.—Usually rather larger than the male, slightly more elongate and depressed. Eyes less convex. Antennæ 10-jointed, third joint rather shorter, apical joint slightly larger. The impressions at the base of the prothorax are deeper, especially the longitudinal furrows; the discal fovea is deeper and comparatively larger, and the oblique impressed lines upon the elytra are more distinct. Length, $1-1\frac{2}{3}$ mm.

This species appears to be a true in-door insect: all the specimens I have examined were captured either among packing-cases, old boxes, &c., in warehouses, or other similar localities.

HOLOPARAMECUS SINGULARIS, Beck.

Male.—Reddish testaceous, very slightly depressed, shiny, finely pubescent. Head sparingly punctured. Eyes very small, projecting. Antennæ 9-jointed (similar to those of *H. depressus*, Curtis). Prothorax considerably broader than the head, convex, slightly narrowed behind, but not constricted; posterior angles obtuse, not elevated; with a large fovea on each side at the base, and a narrow transverse luniform impression between and nearly joining them. Elytra broader than the prothorax, finely and not very distinctly punctured in irregular rows; humeral prominences distinct; sutural stria straight, effaced posteriorly. Length, 1 mm.

This species differs from *H. depressus*, Curtis, in having the prothorax only slightly narrowed and not constricted behind, in the shape of the basal impressions, and in the absence of the discal fovea; another difference, and this will serve to distinguish it at once, is the minuteness of its eyes.

The specimen described above is a male, and was taken by myself under a piece of wood placed upon the remains of a hot-bed in a garden at Holmwood, Surrey, on September 17th of the present year.

SECTION B.—Antennæ 11-jointed in both sexes (*Calyptribium*).

HOLOPARAMECUS CAULARUM, Aubé.

Testaceous, elongate and shining, very finely and sparsely pubescent. Head small, very finely punctured, somewhat rounded in front. Eyes moderately large, convex. Antennæ composed of eleven joints: the first and second rather large and thickened towards the extremity, the third to eighth subglobose

and very small, the ninth rather larger, and the two last forming an ovate club. Prothorax finely punctured, a little longer than broad, sides rounded and strongly constricted behind; the base with an oblong fovea on each side, close to the angles, and connected by a transverse line, which is very deeply and broadly impressed in the centre; the basal margin with a faintly impressed line. Elytra broader than prothorax, finely and irregularly punctured; humeral prominences strongly marked; sutural stria straight, effaced posteriorly. Length, $1\frac{1}{2}$ mm.

Besides the difference in the number of the joints of the antennæ, it may easily be distinguished from the two preceding species by its strongly constricted and proportionately longer prothorax, and by its having the lateral foveæ almost contiguous to the margin, and the basal line strongly impressed in the centre.

The only British specimen I have seen of this species, and from which I have taken the above description, is in the collection of Mr. Oliver E. Janson, who found it in July, 1869, crawling on a whitened wall, at the base of which was a quantity of decaying vegetable matter.

36, Mornington Road, Regent's Park, N.W.,
December 13, 1892.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

BY REV. W. W. FOWLER, M.A., F.L.S.

NO. XI.—BARK AND WOOD.

OF all the methods of collecting Coleoptera there is none perhaps that requires more labour than wood-collecting; at the same time there is none that better repays a collector, or produces rarer species. Some beetles bore into the solid wood, and are therefore hard to obtain; but there are numbers that live between the bark and the wood, and these may be comparatively easily procured. The use of the wood-boring beetles in Nature is obvious,—like the dung-beetles, they are scavengers; when a large tree falls in one of the virgin forests of the tropics, if it remained as it lay it would create a block in the vegetation around that would soon cause a vacant space, and in time the forests themselves would become nothing but a mass of prostrate

and withered trunks: the wood-boring beetles, however (both perfect insects and larvæ), bore holes into the solid wood and open it up to the rain and air; as by this means it becomes more and more rotten, other insects take possession of it, and finally, by the combined influences of the atmosphere and its insect-destroyers, the trunk is reduced to a pulp that serves as a manure for the young trees that are ready to take its place. In our country we are not likely to suffer from any such block to vegetation, for in these days every bit of wood seems to be removed as soon as it falls. Even in the New Forest or in Sherwood it is a rare thing to come across a trunk that has been left long enough for the beetles to take possession of it. It is very tantalising to hear collectors speak of the times when the trunks were allowed to lie year after year as they fell, affording them a rich harvest of species that we are now delighted to find a single specimen of in a day's, or even a week's, hunting. There is, however, a great deal that may yet be done, and the wood-beetles, even the rarest of them, are by no means extinct, and only require another indefatigable collector like Charles Turner to bring them forth again to the light.

The loose bark of fallen trees affords a very good hybernating place for many species of Carabidæ, Staphylinidæ, &c. I remember, as a beginner, taking a great quantity of *Anchomeni* and others in this way on the banks of a pond near Repton; many species also hybernate in the crevices and under the bark of standing trees. I have found *Erirhinus vorax* and many other species in profusion under willow-bark in winter.

The true bark and wood beetles may be divided into several classes:—

Some live between the bark and solid wood; these are usually flat species, admirably adapted by their structure for the narrow space into which they have to squeeze themselves: such are *Dendrophagus*, *Brontes*, *Pytho*, *Pediacus*, *Ips*, *Cerylon*, *Homalota plana*, *Prognatha quadricorne*, and many others; several Hemiptera, too, as *Aneurus levis* and *Aradus depressus*, are equally well suited for this their natural habitat.

Other species like places where the wood is rotten underneath the bark, where the bark, in fact, is loose, and affords a rain-proof covering to the rotten tinder-wood underneath; such bark should be carefully removed and shaken over a sheet, and the

rotten wood underneath should be carefully passed through a sieve, and the whole results stored in bags for examination at home; rare *Euplecti*, such as *E. punctatus* and *E. nigricans*, good *Scydmaeni*, *Batrissus*, *Trichonyx*, very rare species of *Ptinella* and *Trichopteryx*, besides the best of the *Lathridii*, may be obtained or bred out by this method; in fact, any one interested in the minuter species will find this plan, which Mr. Matthews pointed out to me, one of the best possible, if only the standing rotten trees can be found.

Another class of beetles live in the same trees as those just mentioned, but they prefer the dampest spots, where the soft wood has been thoroughly soaked with moisture; in such places I have found *Paromalus* and *Abræus*, and *Baptolinus* and species of *Conurus* are sometimes very abundant. In this connection we may mention the *Phlæophagi*, but these seem to like rather high-flavoured wood; *P. æneopiceus* affecting old damp wine casks, and *P. spadix* rotten stumps near high-water mark that have become thoroughly soaked with salt water.

Other beetles, again, live between the bark and the wood for the most part (sometimes in the bark itself), but, as their form is cylindrical, they have to make galleries in order to give themselves space to move about in; everyone almost is acquainted with the galleries of *Hylesinus fraxini*, but there are other beetles which have even obtained their names from a similar habit, as *Tomicus stenographus*, *T. typographus*, *T. dryographus*, *Pityophthorus micrographus*, &c.

Some beetles bore into solid wood; of these *Platypus cylindrus* is one of the most curious, although it is not in nearly as much request as its rare parasites, *Colydium elongatum* and *Oxylæmus cylindricus*, which are found occasionally in its burrows in the New Forest; *Trypodendron*, *Phlæotrya*, *Melasis*, and others also bore into solid wood. I have taken *Trypodendron domesticum* and *T. quercus* by stripping off the thick bark of a fallen tree in Sherwood Forest, and poking the insects out of their bores with straws or small twigs: this is the best way of procuring them, if practicable, but the bark must be taken off quickly and carefully, or else they retire into their burrows in the solid tree, and cannot be reached. It is the larvæ, as a rule, of the wood-boring beetles that do so much damage by boring into the trunks; the larva of *Scolytus destructor* causes great destruction

among elms; the larvæ of the Longicorns, and many of the Elateridæ, undergo all their changes in solid or rotten wood and under bark, whereas the great majority of the perfect insects are found by beating and sweeping under totally different conditions; many, however, of the Elaters and Longicorns in their perfect state may be taken more abundantly *in situ* out of the wood, before they have left their first abode, or after they have returned to it to prepare for future generations.

The old gnarled branches that jut out from the tops and sides of trees are very productive, but difficult to get at; these and the lower dead boughs will sometimes yield such things as *Platydemia*, *Cistela ceramboides*, *Haplocnemus*, and *Conopalpus* (the latter in abundance); *Phlæophilus Edwardsii*, *Tetratoma desmaresti*, and others may be obtained in some localities, the former in great numbers, by tapping dead boughs on standing trees over an umbrella or sheet. Numerous species of Anobiidæ, Ptinidæ, Cissidæ, and Scolytidæ may be procured by examining dead boughs or branches, or better, by collecting any that seem at all infested, and keeping them at home in boxes, when great quantities may sometimes be bred out.

Very strong tools are required for wood-working; by far the most serviceable weapon is the miniature pickaxe (axe one side and mattock the other), referred to Entom. xv. 61, which was designed by Mr. Matthews (not by Mr. Crotch, as there stated), which is most effectual; a fern-trowel or tack-extractor is, however, quite sufficient for ordinary bark and rotten-wood working.

Perhaps a short list of some of the better wood-beetles, and the trees with which they have been found connected, may form a fitting conclusion for this subject.

The Scotch fir, and other trees of the same kind, appear to yield the largest number of species. Under fir-bark the following have occurred:—*Dendrophagus crenatus*, *Pytho depressus*, *Xantholinus lentus*, *Quedius lævigatus*, *Rhizophagus politus*, *Zilora ferruginea*, *Salpingus ater*, *Pissodes notatus*, &c.; *Polygraphus pubescens*, *Carphoborus pilosus*, *Cis punctulatus*, *Cryphalus abietis*, *Lissodema 4-pustulatum*, and many *Tomici*, breed in fir twigs and branches; and besides these and many others, *Cryptophagus parallelus*, *Ernobius nigrinus*, *Hylastes cunicularius*, *Tetratoma ancora*, *Dircæa lævigata*, *Orchesia minor*, *Mycetophagus fulvicollis*,

and *Athous undulatus* have either been beaten from dry fir tops or found on or in fir-stumps, or in some way or other connected with the tree.

The elm has produced *Brontes deplanatus* (taken in some numbers by Mr. Rye near Richmond), *Ischnodes sanguinicollis* (taken in abundance by Dr. Power at Esher), *Oxylæmus variolosus*, *Trichonyx sulcicollis*, *Quedius truncicola*, *Euryusa laticollis*, *Megapenthes lugens*, and *tibialis*. This latter beetle has occurred to Dr. Power in beech at Burnham Beeches; the beech has also produced *Orchesia undulata*, *Synchita medianensis*, and on one occasion a specimen of *Colydium elongatum* (far removed from *Platypus*).

The oak harbours many good species, especially Elateridæ and Buprestidæ. Dr. Power has kindly given me the following notes from his own experience:—" *Elater lythropterus*, *E. sanguineus*, *E. pomonæ*, oak-stump; *Elater rufitarsis*, inner side of wood of hollow oaks at Windsor; *Ludius ferrugineus*, a number of beetles and larvæ inside a hollow oak in Windsor Forest: this beetle has also been taken inside a hollow walnut at Swaffham, Cambridge; *Anthaxia nitidula* feeds inside hollow wood of old oak, New Forest; *Agrius biguttatus*, between wood and bark of oak: it goes to pupa in the bark and comes out in the second year after cutting." Besides Elateridæ, good species like *Limexylon navale*, *Abdera quadri- and bi-fasciata*, *Pediacus dermestoides*, *Dorcatoma*, *Batrisus*, *Quedius scitus*, and *Q. chrysurus*, and many others, have been taken from the oak. *Agrius sinuatus* has been found in whitethorn under the same circumstances as *A. biguttatus* in oak.

The apple and pear have produced *Scolytus pruni*, and other species of the same class, *Dromius 4-signatus*, *Haplocnemi*, &c.

Willows occasionally harbour a good species abundantly, as *Lamia textor*, taken near Bristol; *Choragus sheppardi*, taken under bark of loose willows near Newark by Mr. Hadfield. *Hallomenus* has also occurred in this tree, but its food is fungus.

The birch seems especially attractive to *Eros*, both *E. minutus* and *E. affinis* having been taken under its bark. Several good Elaters, and beetles such as *Homalium inflatum*, *Rhopalodontus perforatus*, *Epuræa immunda*, &c., seem partial to this tree.

We may perhaps, in passing, mention *Agathidium nigripenne*, *Opilo mollis*, and *Ptenidium turgidum*, from ash; *Lemophlæus*

bimaculatus, *Abdera 4-fasciata*, and *Trichopteryx ambigua*, from hornbeam ; and *Mesites tardii*, from decayed hollies.

The curious beetle *Hylecoetus dermestoides* requires a little consideration ; the specimens at the bottom of the tree, where there is plenty of food, are very large ; in the lower boughs they are much smaller, and in the small boughs at the top of the tree they are only about half or quarter the size of the trunk specimens.

The *Ptinellæ* are curious in their discrimination. *Ptinella testacea* is found mainly on birch, very rarely on oak (under bark of dead trees, better standing than lying down) ; *Ptinella aptera* and *P. angustula* are common on oak, and rare on birch ; *P. brittanica* is probably associated with the apple ; *P. denticollis* is found on almost any species of tree (willow, pine, mountain ash, &c.)

The curious *Anommatus 12-striatus* is found in rotting stumps, sometimes buried some feet beneath the surface of the ground. *Langelandia* should be looked for under the same conditions.

The subject of the wood-boring beetles cannot be more than touched upon in one paper. Many others, such as *Endophlæus*, *Teredus*, and other rare *Colydiadæ* and *Cucujidæ*, might be discussed ; a paper might be filled with the habitats of the Longicorns, which have hardly been mentioned. We have, however, already exceeded our proper limits, and must leave the subject.

The School House, Lincoln, December 12, 1882.

CAPTURES AND NOTES ON THE SEASON IN WEST NORFOLK.

By EDWARD A. ATMORE.

Having seen remarks from several of your correspondents on "the Season," I have resolved to send you a few notes thereon, trusting that they may prove interesting to some of your readers.

At the commencement of the season, a glance at the hedgerows after dusk showed a scarcity of the usually common *Hibernia rupicapraria* and *H. progemmaria*, which caused me to believe that the year would not be a very good one for Lepidopterists. But in nowise discouraged by the outlook, I sugared

birch-trunks repeatedly during March, in hopes of obtaining a series of *Cymatophora flavicornis* in a locality where I knew it occurred, but the result was thus far labour in vain. Frequent nocturnal visits to the sallow-bloom—which by the way is abundant in this neighbourhood—disclosed to me that insects were scarce, or this great natural attraction had lost its attractive powers. Species of *Tæniocampæ* were not common, and I had to content myself with the capture of a few *Xylocampa lithoriza*, varied now and then by an odd *Anticlea badiata* and *Scotosia dubitata*. With the arrival of early summer and more genial or entomological weather (if I may so term it) I made more frequent excursions, but was often much disappointed in the results. Certain it is, that such species as *Eupisteria heparata*, *Ephyra pendularia*, *Hypsipetes impluviata*, *Eupithecia lariciata*, *E. indigata*, *Corycia temerata* and *C. taminata* were to be had, but in very limited numbers, the last species being the commonest. I observe here that our species of *Eupitheciæ* have been, without one exception, comparatively scarce, and also, it seems to me, somewhat erratic in their time of appearance, some of them appearing earlier, but most of them later than usual. One precocious specimen of *E. indigata* was netted as early as the 25th of April; another on the 29th, but the species did not seem to be well out before the end of the following month. Not a specimen of *E. nanata* was observed until the 26th of May, and good specimens continued to occur during June, July, August, and September, so that it was difficult to distinguish the first from the second brood, if indeed there was a second brood, as we may reasonably suppose. *E. pygmæata* was not observed at all, although I more than once trudged several miles in hopes of securing some good specimens for my friends. Whether this species emerged from the pupa earlier or later than usual I cannot say, but from what I learn from Mr. Hodgkinson most probably the latter would be the case. If others have been more fortunate with this species than myself, it would be interesting to know their experience. *Tephrosia punctulata* has been plentiful, and I can confirm Mr. South's remarks on the abundance of *Euchelia jacobææ* in this county. It literally swarmed, and later on in the season its food plant *Senecio jacobææ*, with its stems denuded of leaves, presented a very striking appearance. Turning my attention to Tortrices in May, I met with more

success. Among the species taken were two fine *Retinia turionana*; a fine series each of *Phoxopteryx siculana*, *P. inornatana*, *P. biarcuana*, *P. uncana*, and *Eupæcilia nana*; also odd specimens of *Eupæcilia udana*, *Clepsia rusticana*, *Choreutes scintilulana*, and *Lobesia reliquana*. Macro collecting did not improve much until the end of June, when several species, notably *Melanippe unangulata* and *Coremia quadrifasciaria* began to appear in force, interspersed with a few *Acidalia inornata* and *Emmelesia alchemillata*. However, *Emmelesia affinitata*, usually plentiful, was rare. *C. quadrifasciaria* was boxed in good condition to the number of three dozen or more. *Macaria liturata* I found to be the commonest Geometer in fir-woods, a circumstance of unusual occurrence. *Fidonia piniaria*, generally very common, was relatively scarce. *Larentia didymata*, the commonest Geometer of the season, was everywhere a perfect pest; and in some places *L. pectinitaria*, not so readily recognised on the wing, came in "a very good second." Of the Tortrices taken in June I found *Penthina piceana*, *Pædisca bilunana*, and *Retinia pinivorana*, common; and a single specimen of *Phlæodes demarniana* was dislodged from birch and secured; also odd specimens of *Phoxopteryx diminutana* and *P. mitterpacheriana* were boxed. In July *C. quadrifasciaria* was still plentiful, although of course getting the worse for wear, and a sprinkling of such species as *Acidalia inornata*, *A. incanaria*, *Geometra papilionaria*, *Thera firmata*, and *Aventia flexula* were met with. Early in the evening, on damp portions of our heaths, *Schrankia turfosalis* was abroad in its usual plenty, and *Hypenodes costæstrigalis*, an equally sluggish species, was also to be found. A day on the coast for *Anerastia farrella* resulted in my boxing three specimens only, but taking into consideration the unfavourable weather it was no doubt as much as I could expect. During the month (July) specimens of *Orthotænia ericetana*, *Catoptria juliana*, *Dichelia grotiana*, and *Hypermezia cruciana* were met with; and fortune again favoured me with a long and fine series of *Tortrix lafauryana*, including some beautiful varieties. Two of these specimens have the costal blotches united so as to form one long blotch along the costa. I also succeeded in breeding the species from larvæ found feeding between united leaves and tops of *Myrica gale* (bog myrtle). *Ephestia passulella* and *Plodia interpunctella* were (especially the former) abundant about the Dock Company's premises.

Of the Tineæ taken I note a long series of *Stathmopoda pedella*, which was obtained by beating and shaking the branches of some old alders. The few remaining species found moderately common in this month, and which I have not yet enumerated, are *Agrotis porphyrea* and *Pempelia palumbella* (flying on heaths at dusk), and *Gelechia ligulella*, *Parasia parenthesella*, and *Platytes cerussellus*, most readily obtained by sweeping grassy spots on heaths. During August Macro collecting somewhat improved, but was still far below that of an average season, inasmuch as several species, which to my knowledge had not failed to occur annually, were this time unrepresented. Frequent visits to a locality overgrown with rushes was productive of a good series each of *Crambus hamellus* and *C. latistriellus*, with a few *C. pinetellus*, *C. inquinatellus* and *C. geniculellus*, all of which were met with by day, but were more plentiful after dusk, when they flew freely.

Having thus enumerated the best of the species met with here during the season, I will conclude with a few remarks on one of the probable indirect causes of this generally admitted dearth of Lepidoptera, viz., "the previous mild winter." For the last three or four years I have habitually done some little pupa digging in the autumn and spring, and also, when practicable, during the winter months, but never have I seen, as I witnessed last winter and spring, so many shells and remains of pupæ, which to all appearances had been recently destroyed by carnivorous beetles, earwigs, or other insects of a similar predaceous nature. This I especially noticed when working for pupæ of *Trachea piniperda* and *Fidonia piniaria* beneath the moss in fir-woods. In some instances the "culprit" (generally a beetle or earwig) could be seen, either very near the partly consumed pupa or actually concealed in the pupa itself. That the mild weather experienced during the last winter favoured the work of destructive beetles and other insects of a cannibal disposition (if not their increase), there can be little doubt. Such weather would also enable them to pursue their work of destruction continuously throughout the winter months. This in itself may be sufficient to account for the scarcity of healthy pupæ of *T. piniperda*, and the abnormal scarcity here of imagines of such a common insect as *F. piniaria*, both of which would, as pupæ, lie comparatively unmolested in normal winters. On the other

hand, it is not so easy to account for the unusual abundance of imagines of *Macaria liturata*, a species which is also in the pupal state during the winter months, and therefore under favourable conditions would be subject to attacks of common enemies. It is thus evident that other causes have been operating upon which I can throw no light.

I trust that the whole of the published "Notes on the Season" may be commented on by one or more of our scientific entomologists.

8, Union Street, King's Lynn, Oct. 19th, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

SATYRUS JANIRA, VARIETY.—On the 3rd of August last I caught in a clover field, near Cullompton, Devon, a very curious variety of *Satyrus janira*. All the wings are reddish white; the black eye-spot on the anterior wings is faintly indicated, and is surrounded by a light reddish brown cloud; the under wings have no markings, but the three principal wing-rays are slightly darker. There are no markings underneath. Thorax and abdomen reddish white.—F. A. WALROND; Spring Hill School, Southampton, October 9, 1882.

NOTES ON LYCÆNA BÆTICA.—In the first half of September, whilst in the South of France, I met with *Lycæna bætica* on several occasions, on the coast at Biarritz, flying over a species of *Erica*, and again in several localities in the Pyrenees up to nearly 5000 feet. It was, however, never common. I usually found it in company with *Lycæna alexis*, from which it was with difficulty distinguished on the wing. Staudinger gives the following as the geographical distribution of this species:—"Middle of Europe (except the Eastern portion), centre and South-West of France, Barbary, Canary Islands, Western Asia, and Persia." I believe it also occurs commonly at the Cape. I think if the "blues" on our South Coast were examined with greater care, *Lycæna bætica* would with us be more frequently taken.—A. H. JONES; Shrublands, Eltham, Nov., 1882.

VANESSA URTICÆ.—On the 9th of September last, near the Bel Alp (Brieg, Switzerland), I found a great many pupæ of

V. urticæ which were entirely covered with gold, and not merely with gold spots, as in England. The ground colour was greenish yellow, and the whole pupa was semitransparent, until a day or two before the imago came out. I brought some larvæ from the same place, and kept them in a tin box without much light, and they became dark brown speckled pupæ, without any gold at all. The imagines from the gold pupæ were lighter coloured than those from the brown ones. A week earlier I found at the Engstlen Alp, near Engelberg, some *V. urticæ* pupæ, which were not quite the same colour as English ones, but had the ordinary gold spots. From the same bed of nettles I took some larvæ, and kept them in the tin box, and they turned into pupæ without any gold. I found these at the Engstlen Alp after some days of very wet, dull weather; but when I found the gold pupæ at the Bel Alp the sun had shone moderately for several days. I am curious to know if the amount of gold on pupæ is affected by different degrees of light, or if any other cause is known for the variation.—M. S. JENKYNs; Riverside, East Moseley, Oct., 1882.

[There is considerable variation in the metallic lustre and coloration of the chrysalids of *Vanessa urticæ* in England, and the chrysalids of other butterflies have been observed to be affected by their environment.—J. J. W.]

FOOD OF MELITÆA ARTEMIS. — I have had seven larvæ of *M. artemis* this year. They all declined to eat germander, or either the broad or narrow-leaved plantain, but ate honeysuckle leaves greedily, both the wild and *Lonicera fragrantissima*.—M. S. JENKYNs; East Molesey, Nov., 1882.

PECULIAR ODOUR EMITTED BY ACHERONTIA ATROPOS. — Has anybody noticed the remarkable odour sent forth by *A. atropos* when handled in the imago state? I have had a good opportunity of observing the insect lately, as it has been commoner than usual, three or four being taken on the same evening. As I had some brought to me in a very bad condition, I kept them alive for some days in order to witness their peculiarity of stridulation. Although I believe the exact manner in which this sound is produced has never been satisfactorily discovered, it is too well-known to need comment, but I find that upon pressing the sides of the thorax it also emits a peculiar odour, resembling musk more than anything else; this occurred with all the

specimens I examined.—C. G. HALL; 3, Granville Road, Deal, November, 1882.

[Mr. A. H. Swinton says “a yellow fan or fascicle of hairs, rising perpendicularly from a fold at either side of the anterior part of the abdomen, emits a pungent scent of jessamine” (Ent. Mo. Mag. xiii. 219).—E. A. F.]

NEW FOOD-PLANT FOR *BOMBYX QUERCUS*.—In the middle of May, observing a small Portugal laurel to be much eaten, I looked for the cause, and found a half-grown larva of *Bombyx quercus* on one of the branches. I conveyed it to the house and supplied it with leaves of the same plant. I after that introduced it into the feeding cage daily, together with sprigs of whitethorn, but on every occasion have found the laurel eaten in preference to the other plant. Latterly I supplied it with nothing else, and it continued healthy and grew well until the 22nd of June, when it became full-fed, spun a cocoon, and changed to the chrysalis state. Thus it remained until the 17th of August, when a fine male imago emerged.—OWEN S. WILSON; Carmarthen.

CANNIBALISM IN *PIERIS CRATÆGI*.—On June 26th last, whilst walking with my brother from Visp to Zermatt, we came, soon after passing Stalden, upon a sudden turn in the road where it crossed a small mountain stream. Here disported a perfect flock of *P. cratægi*; so plentiful were they that by one sweep of the net it was possible to capture eight or ten at once. A step or two further we saw what at first sight seemed to be a living and moving white flower in the road, but it dispersed and flew off in various directions at our approach, with the exception of some three or four individuals, which we carefully watched upon perceiving that they were feasting, with extended probosces, on the juices of a fallen comrade of their own species that had been evidently trodden under foot that morning. These three or four it was impossible to drive away from the spot; they seemed half-stupefied with their repast, and only flew away a yard or so when disturbed, to return again at the first opportunity to their cannibalistic employment, and, as it appeared to be, enjoyment. Upon repassing the same spot a few days afterwards we again noticed a large flock of the same species by the stream. Though abundant throughout Switzerland, I never saw them in such countless swarms as here. I may mention that the whole of the Visp

Valley seems an unusually happy hunting-ground for both lepidopterist and coleopterist alike. Almost every flower was alive with species of *Argynnis*, e. g., *A. dia*, *A. aglaia*, *A. euphrosyne*; *Melitæa*, e. g., *M. phœbe*, *M. athalia*, &c.; *Parnassius apollo*, &c.; and throughout the lowlands of both this and the Rhone Valley a large beetle, a species of *Mylabris*, allied to *Meloë*, but more brilliantly coloured with orange and black, was conspicuously abundant. The handsome burnet moth, *Syntomis phegea*, was frequent in one spot; and *Satyrus hermione*, though this was difficult to catch. *Limenitis camilla*, *Polyommatus gordius*, and about fifteen species of "blues" rewarded careful research, with many others. I can quite understand that this locality is, in July and August, a little later than the time we were there, what it is currently reported to be, namely, a paradise of entomological wealth.—J. COSMO MELVILL; Kersal Cottage, Prestwich, Lancashire, Nov. 27, 1882.

NOTES ON *ELLOPIA FASCIARIA*.—Whilst spending a few days last Easter at Brandon, in Suffolk, I devoted some time to beating for pine-feeding larvæ, and, besides some numbers of *Thera variata* and *T. firmata*, procured about thirty of *E. fasciaria*. From one of these resulted, on the 13th of June, a beautiful example of the variety *prasinaria* of Hübner, in which the ground colour is of a soft olive-green, the two transverse bars alone being tinged with red. With regard to the imago of *E. fasciaria*, the information to be obtained from books is not very full, and it may therefore be of advantage to record my experience of it during 1882. The larvæ beaten in April varied very much both in colour and size, the former ranging from bright red to dull green, and the latter being far from uniform, as must be evident from the fact that the appearance of the imagos extended from May 23rd to July 13th. According to my previous experience the latter was a fairly late date for the species, so that I was much surprised when, on September 20th, in the same locality, I took a female *fasciaria* at rest on a pine-trunk. When a novice in matters entomological, "I wasted hateful hours" in digging for the pupæ of *E. fasciaria* beneath pine trees during the winter months, having inferred from Newman's account that this species hybernated in the pupal state. "Now," thought I, "if this female lays, surely the eggs will not hatch till next spring." And

she laid a goodly batch of eggs; but my expectations were falsified, and they hatched exactly three weeks after being laid.—GILBERT HENRY RAYNOR; Hereward Hall, Ely, Dec. 8, 1882.

NOTES ON *ACIDALIA CONTIGUARIA* AND *A. DEGENERARIA*.—Referring to the observation (Entom. xiv. 283) of your correspondent, the Rev. O. P. Cambridge, on the irregular pupating of *Chelonia caja*, I may say that I noticed a similar habit in *Acidalia contiguaria*, the last two of the five years during which I kept the species in confinement. A certain number of the larvæ of each brood would, as your correspondent states, at a certain stage, grow more vigorously and go into pupa, while their fellows would remain stationary, apparently not feeding, and certainly not increasing in size. The larvæ that had spun up came out in the autumn of the same year and deposited eggs, which hatched, and hybernated while still quite small. The others hybernated, and fed up the next spring. I considered that here was doubtless an inherited tendency acquired through natural selection for the better preservation of the life of the species, inasmuch as individuals in various stages of growth would presumably offer varied, and therefore proportionately greater, powers of resistance to the accidents of climate and season and the contingencies incidental to the struggle for existence. Through the kindness of Mrs. Hutchinson, who sent me the young larvæ, I have been this year enabled to breed *Acidalia degeneraria*, and I find the same tendency in this species, as some larvæ fed up and emerged this autumn; and from these I have young larvæ, which are now hybernating in company with the members of the previous generation. Another habit I may here mention, as having noticed in *Acidalia contiguaria*, is that of the larvæ spinning up very frequently in pairs, *i. e.*, of two larvæ placing their cocoons in close proximity, sometimes a part of the thin network forming a common wall to the two cocoons. This habit, doubtless, is not confined to the species mentioned, and I would here wish to ask any of your correspondents, who may have also observed it, whether they have noticed any rule as to the sex of the insects thus spun up. If of opposite sex, it can be very easily conceived that a habit of this kind may be of great advantage to species which inhabit bleak and exposed situations where the conditions of existence are severe, as there will thus be a greater probability

of the necessary fertilisation of the eggs.—HERBERT FORTESCUE FRYER; The Priory, Chatteris, December 12, 1882.

NOTE ON *YPSIPETES ELUTATA*.—In the November number of the 'Entomologist' (Entom. xv. 253) I stated that a race of *Ypsipetes elutata* was found in the mountains of the Island of Arran, *apparently* feeding on the heath. In the December number (Entom. xv. 285) Mr. G. T. Porritt suggested that bilberry was more likely to be the food-plant. I have written to Mr. M'Arthur on this question, and he assures me that high up in the mountains, where he took this topomorphic variety, the *Vaccinium myrtillus* does not grow; and that he entertains no doubt that the larvæ of this small dark variety fed on the heather, *Calluna vulgaris*. At the time I wrote the communication adverted to above, I suggested to Mr. M'Arthur that the larvæ fed on some small herbaceous willow, but he replied that he felt positive that such was not the case. I am much obliged to Mr. Porritt for giving me an opportunity of discussing this question, as his experience tends to show that in the neighbourhood of Huddersfield the bilberry, *Vaccinium myrtillus*, is commonly the food-plant of the larvæ. Inasmuch as by many botanists the Vacciniaceæ are treated as a section of the Ericaceæ, the genera *Vaccinium* and *Calluna* are probably closely allied, certainly much more nearly to each other than either genus is to the willows, Salicaceæ, on which the larvæ of *Ypsipetes elutata* are well known to feed. I therefore think the fact that the larva of this insect is a heather feeder is fairly established. By some accident, which I am unable to explain, the word *Eubolia* has been inserted in my communication to the 'Entomologist,' p. 284; my intention was to have written two species of *Cidaria*.—J. JENNER WEIR; 6, Haddo Villas, Blackheath.

COLEOPHORA SALINELIA.—I have pleasure in recording the rearing of about two dozen specimens from larvæ, which Mr. Stainton pronounced to be those of this species. The larvæ were found in October, feeding on *Suaeda maritima*, a plant which appears to be pretty generally distributed over the salterns on the Essex coast. The insects emerged at the end of June. I had previously a series of a *Coleophora* in my collection, bred from sea chenopodium, which I had been informed were the above-named species; but I am now satisfied they are distinct species,

though closely allied. I hear, upon very good authority, that the *Coleophora* larvæ, which feed on the seeds of the sea chenopodium, will not eat the seeds of the common chenopodium of our fields. I therefore incline to the opinion that when the cases of the two are compared, and we are better acquainted with their natural history, the salt-marsh insect will have to be separated from *C. tengstromella*, which name at present applies to both.—WM. MACHIN; 22, Argyle Road, Carlton Square, E., Dec. 20, 1882.

NOTES ROUND BROMLEY, KENT.—As there have been no notes in the 'Entomologist' about the season in this part of Kent, my experiences may be interesting. The season as a whole has been decidedly bad, although not nearly so much so as in other localities. Sugar, indeed, has been almost an entire failure, only one good insect coming to the sweets during the whole season, viz., *Dicycla oo*, and that in very limited numbers. On the other hand, during June and July, *Geometræ* were abundant on warm evenings, such insects as *Acidalia pusaria*, *A. exanthemaria*, *Iodis lactearia*, *Hypsipetes elutata*, and *Hemithea thymiaria* being very common, while *Phorodesma bajularia*, *Geometra papilionaria*, *Pericallia syringaria*, *Corycia temerata*, *Melanthia albicillata*, *M. unangulata*, &c., were taken in smaller numbers. On the fences, in the early part of the year, *Acidalia trigeminata*, *Lobophora hexapterata*, *Coremia propugnata*, and *Ligdia adustata* were the best among numerous commoner species. In September and October the lamps and ivy were quite as productive as at the same time last year, but sugar still continued almost useless. At the lamps *Ennomos tiliaria*, *Eubolia cerviniaria*, *Hydræcia micacea* and *Anchocelis lunosa* were of frequent occurrence; and I took one specimen each of *Epione apiciaria*, *Ennomos erosaria*, and *Cirrædia xerampelina*. At ivy there was an abundance of insects, although the greater number were common species, chiefly consisting of *Orthosia lota*, *Cerastis vaccinii*, *C. spadicea*, *Anchocelis pistacina*, and the other usual visitors to the tempting blooms.—P. WATCHURST; 11, Hope Park, Bromley, Kent.

CAPTURES IN NORFOLK.—Owing to ill health I was compelled to leave London, in November, 1881, and from that time till September, 1882, I remained at Great Yarmouth (a place that entomologically has been known to yield its share of good things), taking occasional trips into the Fens. During the spring

months insects appeared to me to be decidedly scarce, but larvæ of common species, such as *Chelonia cava*, *Bombyx quercus*, *Odonestis potatoria*, *Boarmia rhomboidaria*, *Camptogramma bilineata*, *Leucania lithargyria*, *L. pallens*, *Triphæna orbona*, &c., were abundant. At the end of May and the beginning of June *Eubolia lineolata* was common on the North Denes, and *Heliothis dipsacea* could be taken plentifully, flying at the blossoms of *Lotus corniculatus*, with which the Denes at this time are covered. On 21st June I went to Ranworth for a few days, and there the scarcity of Lepidoptera was most marked; and although most of the nights were favourable for collecting, very few species were seen. *Charocampa elpenor* was taken twice, once at sugar; *Hyria auroraria* and *Acidalia immutata*, both of which in former years I have taken abundantly, were far from common, but some good specimens of each were obtained; *Collix sparsata* was scarce, but *Hypsipetes elutata* was very common, there being hundreds of them in every possible variety. A few each of *Leucania pudorina* and *L. straminea* were taken, and I managed to secure two very good specimens of *Senta ulvæ*, one being the variety with black spots on the fore wings; *Plusia festuæ* was not uncommon, and of *Hydrelia unca* I took good specimens. Returning to Yarmouth on 1st July, I visited that part of the North Denes known as the "Marrams," and found *Leucania littoralis* in splendid condition and in large numbers, but *Nonagria elymi* rather worn and scarce; later on I took this insect in good order; *Agrotis velligera* and *A. tritici* were both common, but *Mamestra abjecta* was rare, four specimens only falling to my lot. Such insects as *Leucania pallens*, *L. impura*, *Xylophasia polyodon*, *Triphæna pronuba*, &c., I certainly never saw so numerous before, swarming as they were at the flowers of *Arundo arenaria*. *Leucania conigera*, and *L. lithargyria* were common; *L. comma* (a curious insect I thought to see there) and *Agrotis aquilina* occasionally put in an appearance, while *Caradrina blanda*, *C. cubicularis* and *Luperina testacea* could be taken freely; of *Cerigo cytherea* I took but one specimen. On July 29th, in splendid weather, I left here for Horning, my principal object being to take *Nonagria brevilinea*; I found it certainly, but during the few nights I was there I only managed to take five specimens. Among other species, *Nudaria senex*, *Lithosia griseola*, and *L. stramineola* were rather common; *Epione apiciaria* was abundant.

I netted one *Geometra papilionaria*, unfortunately a male; and for one or two nights *Eupithecia tenuiata* was out in considerable numbers; *Phibalapteryx lignata* and *Scotosia rhamnata* were both in good condition; and *Cidaria testata* was so numerous as to be almost a nuisance. Of Noctuæ, *Leucania phragmitidis* was common, but *L. straminea* was not nearly so numerous as I have seen it; *Nonagria despecta* and *N. fulva* could be taken in plenty, the specimens of *N. fulva* being particularly well coloured; and *Apamea fibrosa* was very common. The night of Wednesday, August 9th, was a perfect one for collecting, and I had a good time of it at Salhouse (a place a little above Horning) with *Nonagria neurica*, that night and the three following producing about forty specimens, although I am sorry to say the majority of them were rather worn. On the 17th August I again tried the Denes at Yarmouth, but the weather was bad, and as the grass in the best locality had been cut down I only took a few *Agrotis cursoria* and some good specimens of *Hydræcia nictitans*. The larvæ of *Papilio machaon* were again common at Ranworth and Horning; I heard of one or two marsh-men having as many as five hundred each. Unfortunately these men are not very careful in their manipulation of the larvæ, hundreds being crowded together in a small box, and consequently large numbers of them perish before, or immediately after, assuming the pupa state. The pupa too is often subjected to the roughest treatment; I had two dozen of a man at Ranworth, and from an examination I made of them I should think that certainly fourteen must result in cripples, even if they emerge at all. Larvæ of *Smerinthus populi*, *Dicranura vinula* and *Acronycta megacephala*, I found in profusion, together with a few *Notodonta dictæa*, on the poplar trees, in the cemetery attached to the fine old church of St. Nicholas, Great Yarmouth. Had my health been better and allowed me to get out more often, the number of species quoted would have been considerably augmented.—G. R. HARMER; Conway House, Pembridge Sq., W.

LEPIDOPTERA AT EASTBOURNE.—Although I can record some few exceptions among the Diurni, Eastbourne has followed the general rule, and the scarcity of insects has been as proverbial here as elsewhere this season. On the Downs *Lycæna corydon* swarmed, and those I took were unusually fine and very perfect; I managed to secure about a dozen *L. agestis*, evidently just out,

while my sister obtained nearly the same number of *L. alsus*. I only saw a few specimens of *Chortobius pamphilus* and *Satyrus janira*, while *L. alexis* was remarkable for its absence. Two entomologists told me they were taking *Melitæa artemis* at Abbot's Wood, but that they were scarce and much spoilt by the weather. Imagos of *Tanagra chærophyllata* were very common, and we netted many fine specimens in a very short time. All larvæ were scarce, and did not repay the trouble of beating for them. On July 22nd, while entomologising at Abbot's Wood with Mr. Harold Hodge, we saw a very fine male *Apatura iris* close to us, sometimes flying over our heads and then returning to its favourite throne. Soon after Mr. Hodge secured a specimen of *Limenitis sibylla*, evidently injured by some bird, but not at all worn. I mention this because, though so common in the New Forest, *L. sibylla* is always a scarce insect here. A fair number of *Arge galathea* were on the wing, flying sluggishly, but those I took were very fine and apparently freshly emerged from the pupa. *Thecla quercus* was fairly represented at its favourite haunt, the mountain ash; *Argynnis paphia* plentiful; *A. aglaia* and *A. adippe* very scarce, and all so spoilt by the constant rain that it was next to impossible to secure anything like perfect specimens. I have only seen occasional specimens of the *Vanessidæ*, only one *V. cardui*, and *Gonepteryx rhamni* has been equally scarce. *Hesperia sylvanus* and *H. linea* fairly common, but *Satyrus hyperanthus* rare. Larvæ of *Chærocampa elpenor* are usually abundant here in August, but I failed to procure more than eighteen full-fed larvæ, all of which pupated successfully. I then captured a fine *Acrida viridissima*, the large cannibal grasshopper, so common at Folkestone, and mentioned by Mr. J. W. Hall in the November 'Entomologist,' which I kept alive until a few days ago; its habits were very interesting to watch, while its loud chirp resounded all over the house after dark. In September I usually cut a supply of the flower heads of *Saponaria officinalis* (soapwort), and from them obtained a quantity of larvæ; as also those of *Dianthæcia cucubali* from *Silene inflata*, but this season, though I cut more heads than usual, I only found three larvæ. I have forgotten to mention that larvæ of *Bryophila perla* and *B. glandifera* were, as last year, plentiful, and the imagos equally so in July.—R. M. SOTHEY; Rozel, Eastbourne, Nov. 14th, 1882.

NOTES ON THE PAST SEASON.—The dearth of Lepidoptera this season has been as marked here as it has been in other places. The mild winter and the storm of April 29th are, I think, to be blamed for the empty store-boxes. The sallows were too forward, and produced but little,—a few *Tæniocampa gracilis*, *T. munda*, and one example of *Xylina semibrunnea*, being the reward of several nights' hard work. A few *Brephos parthenias* were taken, and *Melitæa artemis* turned up in some numbers. One specimen of *Stauropus fagi* was taken at rest on a holly tree by one of my pupils. *Arge galathea*, usually so abundant here, was very scarce, and I had great difficulty in procuring a dozen for a friend. I spent August at Lulworth Cove, but nothing was on the move there; and I did not set a lepidopterous insect the whole time. The sugar-pot and the ivy-bloom have proved no use; and the only thing that remains is to wish for better times.—[Rev.] A. C. HERVEY; Titchfield, Fareham, Hants, November 23, 1882.

LEPIDOPTEROUS LARVÆ AND YELLOW FLOWERS. —The larva of *Heliothis armigera* seems to have a partiality for yellow flowers. I found some feeding on the flowers of evening primrose at Biarritz in October last year; failing that, they readily took to honeysuckle flowers. When I brought them to England, and offered them a choice of chrysanthemums (the only flower I had at that time), they preferred yellow ones, and thrived upon them. One day I gave them a red chrysanthemum, and they would not eat that, but ate one of their number; they had shown no tendency to cannibalism on the journey when the honeysuckle was not fresh. Last June I had two larvæ of *Chesias spartiata*, one dark green (as described in Stainton's 'Manual'), feeding on the leaves of broom, the other entirely yellow, feeding on the flowers. They were on the same plant; the yellow one never touched the leaves, but the green one occasionally ate the flower. A larva of *Lithosia quadra* was sent me in June. I had never seen one, and, not knowing that lichen was its proper food, I gave it a selection to choose from, and it preferred yellow broom flowers, though it tried a little elm, buckthorn, cherry, and lettuce. M. S. JENKINS; East Molesey, Nov., 1882.

CERAMBYX CERDO, L., AT DEAL.—A fine female example of this beetle was taken at the back of the town last August, and

brought to me alive. This is the *Cerambyx heros* of Stephens' 'Manual.' There appears to have been some confusion with this insect. According to Stein and Weise, in their 'Catalogus Coleopterorum Europæ,' the synonymy should stand thus:—Genus *Cerambyx*, L.; *cerdo*, L. = *heros*, Scopoli; *scopolii*, Fuessly, = *cerdo*, Scop. The latter insect, *Scopolii*, is the *cerdo* in Stephens' 'Manual,' and has been taken on willows about Deptford and Isle of Ely. Stephens makes Fabricius the author for both *heros* and *cerdo*, but M. Marseul, in his 'European Catalogue' (1866), omits the name *heros*, and gives *cerdo*, L., and *Scopolii*, Laicht. Is the latter synonymous with *Scopolii*, Fuessly? *C. cerdo* (*heros*) has occurred at Portsmouth Dockyard, and various other places, at long intervals, and, although many entomologists are of opinion that it existed here in former days when our forest-land was more extensive, the fact of it generally occurring in places where there is shipping leads me still to believe that it is only imported amongst foreign timber.—C. G. HALL; 3, Granville Road, Deal, Nov., 1882.

STUDENTS OF DIPTERA WANTED.—Having for over twelve years collected Lepidoptera, I now intend to collect Diptera. The purpose of my calling attention to the fact is simply to obtain help through the kind correspondents of the 'Entomologist.' I shall be grateful for information relating to the distribution and habits of any species or genera of Diptera; for specimens forwarded to me I will endeavour to send their exchange value. I shall also be happy to have my attention called—by letter, or notes in the 'Entomologist'—to any memoirs, monographs, or notes on the order. Hoping to meet with a favourable response.—HERBERT E. NORRIS; St. Ives, Hunts, December, 1882.

[Certainly the study of our Diptera is sadly neglected. With the help of Schiner's 'Die Fliegen,' of the Fauna Austriaca, much progress may readily be made. Messrs. G. H. Verrall (Newmarket) and R. H. Meade (Bradford) are the British authorities on the order.—E. A. F.]



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CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI*.

BY RICHARD SOUTH.

(Continued from vol. xv., p. 149.)

ACIPTILIA, Hb.

baliodactylus, Zell.

tridactylus, Stph.

(PLATE I., FIG. 1.)

IMAGO.—Expanse, 10–13 lines. Fore wings whitish, sometimes with a pale brown or pale ochreous brown tinge; the costa is narrowly edged with dark brown to beyond the middle, at which point is situated a small linear spot darker than the costal edging; beyond this, and nearer the tip of outer digit, is a grey-brown cloud of variable intensity. Fringes grey-brown. Tips of both digits pointed, that of the inner slightly deflexed. Hind wings, fringes of the three feathers dark grey-brown, shafts paler. Head, thorax and legs same colour as fore wings. Abdomen with a yellowish tinge. July and August.

LARVA.—Length, 7 lines, tapering towards anal extremity. Head smaller than 2nd segment, yellowish green; a small black spot on each cheek, and brown mandibles. Ground colour dingy green, segmental divisions and dorsal line yellowish green. Tubercles, two dorsal rows (four on each side) whitish, with tufts of white hairs; subdorsal and spiracular rows, two warts on each segment, the anterior wart on each segment in both series is the largest, and one hair of the fascicle emitted therefrom is longer than the others. Prolegs and anal claspers transparent yellowish green. Food, marjoram (*Origanum vulgare*). Eats the terminal leaves; generally to be found at rest in the daytime on a plant, the top of which the larva has caused to droop by biting into the stem. Feeds in the evening. June.

PUPA.—Colour dingy green, a broad dorsal stripe obscure red-brown; dorsal hairs and warts as in the larva; sometimes the whole of the dorsal area is suffused with red-brown; in this case the wing-cases are pale green, and the antennæ-cases either brownish green or red-brown; fastened by anal segment to some portion of food-plant, often to a leaf or stem of the withered top. July.

Plate I., fig. 1, *Aciptilia baliodactylus*; 1 a, larva; 1 b, ditto, enlarged; 1 c, pupa, enlarged; 1 d, food-plant, marjoram (*Origanum vulgare*).

I expect this species will be found not uncommon wherever the food-plant occurs in any quantity.

Thanks to Mr. A. B. Farn, larvæ of this species were found by Mr. Carrington and myself in Kent, in June last.

ACIPTILIA, Hb.

pentadactylus, Linn.

tridactyla, Scop.

(PLATE I., FIG. 2.)

IMAGO.—Expanse, 12–14 lines. Fore wings white, sometimes with a faint yellowish tinge; a few minute black scales on the inner margin of outer digit, and small dark grey dot in the curve of inner digit. Fringes long, white and silky. Tips of both digits pointed and deflexed. Hind wing white, with long white silky fringes; a small dark grey spot on the fringe near the middle of 2nd feather. Head, thorax, abdomen and legs white. June—August; most often seen in July.

LARVA.—Length, 8 lines; fairly stout, tapering slightly posteriorly. Head smaller than 2nd segment, shining yellowish; face pale greenish, a dark brown spot on each cheek; mandibles pale brown. Ground colour green; the dorsal area is margined by narrow whitish lines running from the 3rd segment; on these lines, at the posterior edge of each segment, is a large, somewhat triangular yellow spot, the enclosed ground colour is thus formed into a series of lozenges, intersected by the darker intestinal canal; the yellow spots on the 9th segment coalesce, forming a conspicuous blotch. Tubercles, two dorsal rows (two on each segment) black, from 5th to 11th segments inclusive, the others are of the ground colour; each emits a tuft of hair of unequal lengths, the shorter ones are whitish and the longer dark grey; two long grey hairs project over the head from the edge of 2nd segment, and there are also single grey hairs of considerable length rising from each of the dorsal warts on the 2nd, 3rd, 4th, 11th and 12th segments; those on the anterior segments stand nearly erect, whilst those on the posterior segments curve backwards. Subdorsal, a row of black warts, with tufts of short whitish and longer dark grey hairs; the spiracular row of warts

are transparent, and emit hairs as in the subdorsal set. Prolegs and anal claspers semitransparent, tipped with pale brown. May and June, on convolvulus (*Calystegia sepium*), eating the leaves and flowers; rests on the undersides of leaves and on the stems.

PUPA.—Pale green at first, afterwards greyish green, with three rows of black dorsal spots; hairs similar to the larval arrangement; fastened by the tail to a leaf or stem. May and June.

Plate I., fig. 2, *Aciptilia pentadactylus*; 2 a, larva; 2 b, ditto, enlarged; 2 c, pupa, enlarged; 2 d, food-plant, convolvulus (*Calystegia sepium*).

I am obliged to Mr. John T. Carrington for a supply of the larvæ of this species.

The imago is perhaps more often seen than that of any other species of the British plume moths; but although generally distributed it is nowhere, I think, so abundant as are one or two other species of the family in particular localities.

AGDISTIS, Hb.

bennetii, Curt.

(PLATE I., FIG. 3.)

IMAGO.—Expanse, 10–12 lines. Fore wings entire, tip subacute. Ground colour grey, sprinkled with brownish scales; centre of wing and towards hind margin slightly ochreous, sometimes rosy; above the inner margin are four black dots, the posterior of which varies in size, in some specimens being represented by a mere speck; near the costa and towards the apex is another black spot, and in some examples a sixth spot lies near the anal angle. Fringes grey-brown. Hind wing entire, hind margin slightly indented before the middle, dark grey, smoky at the base and inner margin, and anal angle blackish; fringes grey-brown. Head, body and legs grey-brown. June and August.

LARVA.—Length, 8 lines; slightly tapering posteriorly. Head smaller than 2nd segment, into which it is withdrawn when the larva is at rest; the colour is yellowish green; the crown, and a broad patch therefrom nearly to the mandibles on each side, rosy; a few short bristles are scattered over the upper portion of the head. Ground colour green, so thickly sprinkled with small white dots as to appear whitish green to the unassisted eye; skin considerably roughened and wrinkled laterally; the anterior segments are wrinkled dorsally also. No tubercles; the 2nd segment has horn-like points protruding from about its middle in a horizontal direction, the tips and bases of these are rosy; the anal segment is yellowish green on the sides, violet brown dorsally, and has four bristles projecting along its posterior edge at right angles with the claspers;

12th segment with a rather rosy horn, a yellowish stripe along the spiracular region. Food, sea-lavender (*Statice limonium*). July. Second brood, September to May (after hybernation).

PUPA.—Green, thickly sprinkled with white dots, and more or less suffused with violet-brown; wing- and antennæ-cases darker green; thorax slightly humped; head truncate, tipped with violet-brown. Suspended by the tail from withered leaf or flower-stem of food-plant. May, July.

Plate I., fig. 3, *Agdistes bennetii*; 3a, larva enlarged; 3b, pupa, natural size; 3c, ditto, enlarged; 3d, food-plant, sea-lavender (*Statice limonium*), showing where larvæ have fed.

I have to thank Messrs. Henry Moncreaff and E. G. Meek for larvæ of this species.

The hibernated may be found as soon as the food-plant throws out fresh leaves in the spring. Mr. Moncreaff says (Entom. v. p. 321) that where the plant shows signs of having been eaten the larva should be looked for. It resembles the plant in colour, and falls off its food on the slightest disturbance. Mr. Meek tells me that the larva is extremely difficult to find, as it unfortunately happens that leaves of sea-lavender, with holes and niches in them, are anything but scarce in the habitat of the insect. It would appear, therefore, that to obtain these larvæ one must be prepared to devote considerable time to the enterprise.

Mr. Carrington, who is familiar with the habits of *Agdistis bennetii* in a state of nature, informs me that the perfect insects, which are double-brooded, may be disturbed from among the food-plants on the salt marshes, near the estuaries of our rivers, throughout the day, especially during fine, calm afternoons; but the time of flight is shortly after dusk until midnight.

ACIPTILIA, Hb.

spilodactylus, Curt.

obsoletus, Zell.

(PLATE I., FIG. 4.)

IMAGO.—Expanse, 10–11 lines. Fore wing white, with a slight ochreous tinge; the markings are a black spot of irregular shape at the digital juncture, and four small linear black dots placed thus,—one on the costa just beyond the middle, one below this on the inner margin of inner digit, and one in the tip of each digit. Fringes whitish, grey at the tips of both digits, and a large greyish blotch about the middle of fringe of inner margin of inner digit. Tips of both digits pointed, that of inner deflexed.

Hind wing, shafts of feathers pale shining grey; fringes darker grey, long and silky. Head, thorax and legs white. July and August.

LARVA.—Length, 6 lines; attenuated posteriorly from 5th segment. Head smaller than 2nd segment; green, with a yellowish tinge; crown slightly freckled with brown; cheek spots small, brown; mandibles brown. Ground colour green, sprinkled with minute black dots. Tubercles, two dorsal rows (four on each segment) whitish, each emitting a star-like tuft of white hairs; subdorsal, one wart on each segment, with a star-like tuft of white hairs; spiracular, one wart on each segment, emitting a star-like tuft of white hairs, and two or three longer whitish hairs. Prolegs and claspers semitransparent, with a green tinge, and tipped with brown. Food, white horehound (*Marrubium vulgare*); feeds on the terminal leaves; rests on the upper surface of a leaf in damp or dull weather, but hides under the leaves when the sun shines. June and July.

PUPA.—Green, with whitish warts and hairs; wing-cases paler green. thickly studded with short whitish bristles along the edges. Fastened by anal segment to upper surface of leaf of food-plant. July.

Plate I., fig. 4, *Aciptilia spilodactylus*; 4 a, larva, enlarged; 4 b, pupa, enlarged; 4 c, food-plant, horehound (*Marrubium vulgare*).

I have to acknowledge my obligation to Mr. Carrington for a supply of the larvæ of this species, obtained from Mr. Rogers, of Freshwater, Isle of Wight. In 1879 I met with this "plume" in all stages in the Isle of Wight. Horehound, the food-plant, is very local in Great Britain, and in some places its growth is of a most stunted character; a few plants I met with in Norfolk were only about two inches high. In gardens, however, the plant usually attains a respectable size, and I have found it more profitable to search such plants, when they could be found, within say a two-mile radius of the wild plants.

All the larvæ I obtained at Ventnor, Isle of Wight, were taken off horehound growing in cottage gardens, about a mile from the reputed locality of the wild *Marrubium*.

12, Abbey Gardens, St. John's Wood, London, N.W.

(To be continued.)

NOTES ON OAK-GALLS AT KEW.

By R. ALLEN ROLFE.

IN the 'Entomologist' for March, 1881 (Entom. xiv. 54), some notes were published by me on the spread of various galls to species of *Quercus* other than *Q. Robur*, L., our common English

oak, chiefly owing to the different species and varieties being planted in close proximity to each other.

In the present paper I hope to redeem a promise then made, by recording a few additional observations on the same subject.

During the past two seasons I have frequently examined different species of *Quercus* for galls, both the spring and autumnal ones; and, besides verifying most of those previously recorded, am able to make the following additions to my former list.

Q. FARNETTO, Tenor.—Closely allied to *Q. Robur*, but with much larger leaves; fruit 2-4, sessile at the ends of the branches, and scales of the cup pubescent. Native of Italy and Greece.

Neuroterus lenticularis, Ol.—Has been common on this oak during the past season.

Q. LUSITANICA, Webb.

N. numismatis, Ol.—Common both in 1881 and 1882 on a large isolated tree, which has produced all the five species noted by me. The same gall has been common upon *Q. Boissieri*, Reuter, during both seasons; but it is only a form of *Q. infectoria*, Oliv., on which the silk-button gall seems quite at home.

Q. ROBUR, L.—I have met with the following additional galls on this species:—

Spathegaster aprilinus, Gir.—Last spring I met with gall which I believe to belong to this species, but the fly had escaped; next season perhaps it will occur again, giving me an opportunity of verifying the determination.

Andricus quadrilineatus, Hart.—In 1881 this gall was most abundant, but last year equally rare.

Andricus amenti, Gir.—On the 12th of May, 1881, I found one specimen of this gall; the fly had then escaped.

Dryophanta longiventris, Hart.—The galls of the genus *Dryophanta* are certainly very puzzling: the common *D. divisa*, Hart., is distinct enough; also *D. scutellaris*, Ol., when large,—the common cherry-gall. I have a third species, which must be *D. longiventris*, Hart., by the description and figure (Entom. ix. 146); but if I am correct this species is not so rare in Britain as supposed, for I have it from Derbyshire, and have collected it myself in Cassiobury Park, near Watford, Herts; and at Kew. At first I mistook it for *D. scutellaris*, dwarfed by inquiline, as a tree affected with the large cherry-galls in 1879 was in the

following year rather crowded with this smaller gall; nor could I find a single large one. They are 2-3 lin. diam., thick-walled, flattened at base, with bands of a paler colour, often raised into small papillæ; if in the sun they acquire a rosy tinge, but in the shade are green, with nearly white papillæ. The gall mentioned as *D. scutellaris* on *Q. Turneri*, Willd. (which, by the way, still retains its beautiful rose-colour, as when gathered), belongs to this species.

Aphilothrix globuli, Hart.—The “two specimens” of “*A. autumnalis*, Hart.,” of my former paper (*l. c.*, p. 54), belong to this species, and should be corrected.

A. albopunctata, Schl.—Fairly common, both in 1881 and 1882.

It will be noticed that varieties of *Q. Robur* are not mentioned in this paper, but I have come to the conclusion that for entomological purposes this is unnecessary; galls that occur upon one will also be found upon another, when planted together. Even the rich colours found in vars. *purpurea* and *concordia* do not afford any protection from the insects.

Until last autumn I had not noticed any difference in the colour of the galls found upon the leaves of the purple oak; then, however, a tree of the var. *Granbyana*, Hort., was observed to have quantities of *N. lenticularis* galls, all of a uniform blackish purple, darker than the leaves, which are not nearly so dark as the var. *purpurea*,—a curious concentration of the colouring pigment in the gall tissue.

There are two points in my former paper worthy of a passing note, *viz.*—1st, The curiously attenuated galls of *Cynips Kollari* on *Quercus Turneri*; and 2ndly, The acorn-galls of *Andricus glandium* on *Quercus Cerris*, and its variety *Lucombeana*.

Respecting the former no doubt can now exist that *Cynips Kollari* is the maker, for that insect has been bred by me from a number of galls kept separate for the purpose; also some of the usual inquilines. I have met with approaches to the same form on *Q. Robur*.

Of the galls of *Andricus glandium*, gathered in 1879, a large number were preserved; these still contain healthy larvæ, apparently as much so as some gathered this autumn. I am awaiting the result with much curiosity; surely they will die before long,

or else become pupæ, and finally assume the perfect state. Last autumn they were again very abundant.

In the 'Gardener's Chronicle' for 1868 (part 1, p. 295), a paper was published by Mr. J. Barnes, of Bickton, on the "Ravages of Oak-galls." In this paper a list of "Varieties of Oak on which *Cynips Kollari* is found," occurs, and as Miss Ormerod has copied the same into her 'Manual of Injurious Insects' (p. 213), an analysis may not be considered out of place in these pages.

Quercus Tauzin and *Q. pyrenaica* are synonyms of *Q. Toza*, Bosc.

Q. Turneri, a supposed hybrid, is placed by DeCandolle under *Q. lusitanica*.

Q. pedunculata, *Q. pendula*, *Q. pubescens*, *Q. sessiliflora*, *Q. Louettii*, and *Q. heterophylla*, are all forms of *Q. Robur*, L.

The above are known to me as affected by *Cynips Kollari*.

Q. australis, Link, is a synonym of *Q. lusitanica*, Webb, on which I have not yet seen *C. Kollari*, excepting on the supposed variety *Clusii*, DC., the *Q. Turneri*, Willd.

Q. dentata, Wats., and *Q. asplenifolia*, Hort., are forms of *Q. Cerris*, L., on which *C. Kollari* has probably never been found. It is not unlikely that varieties of *Q. Robur* are meant by these names. *Q. magna-maculata* is also most likely a form of the same.

Q. dentata, Thunb., is a Japanese oak; and *Q. mongolica*, Fisch., a native of Amur, Mandschuria, and Dahuria.

Q. alba, L., *Q. rubra*, L., and *Q. prinus*, L. (of which *Q. montana* is only a synonym), are all North American species; while *Q. xalapensis*, Humb. and Bonpl., is from Mexico. I have not yet seen *C. Kollari* on either a Japanese or an American oak, though every facility for their spread occurs at Kew; I have seen branches touching, and even intermingling with, galled branches of *Q. Robur* without becoming affected. Possibly some of the names represent forms of our common oak, which exists in collections under a host of names. If, on the other hand, this gall really does occur on the species in question, it is a most interesting fact.

In conclusion, I would say that it will give me much pleasure to forward the name of any extra-European oak, on receipt of a small gall-bearing branch of the same.

Royal Herbarium, Kew, December 18, 1882.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. III.—CRYPTIDÆ (*continued*).

Two species are added to the sixty included in Marshall's catalogue,—*C. antennatus*, Bridgm. (see Trans. Ent. Soc., Lond., 1881, p. 153), and *C. amœnus*, Gr. (Entom. xii. 55); and *C. dubius*, Tasch., has lately been bred by Mr. T. Wilson from rose sticks, where it is a parasite of *Emphytus cinctus*; whilst *C. elegans*, Desv., is not considered as a variety of *carnifex* (Trans. Ent. Soc., Lond., 1881, p. 153); neither is *C. ornatus*, Gr., considered a variety of *tricolor* (Trans. Ent. Soc., Lond., 1882, p. 143). Hitherto the species commonly bred from the sawfly (*Trichiosoma*) cocoons has in this country been considered identical with the true *C. migrator*, so commonly bred from the cocoons of Bombyces and other Lepidoptera; the former is *C. cimbicis* of Tschek. (Verh. z.-b. Gesell. Wien., xx. 412). Everywhere the very closely-allied *C. migrator*, *incubitor*, *fumipennis*, *cimbicis*, &c., have been much mixed; it is hoped the distinctions given in the above tables will help to correct this, but it is necessary that all bred specimens should be closely examined. The species included under *hostilis* and *porrectorius*, by Marshall, are also much confused by various authors.

C. attentorius is figured in Schäffer's 'Icones' (pl. 157, fig. 7), *C. minutorius* is figured by Panzer under the name of *rubricator* (pl. 84), *C. seticornis* (var. of *Dianæ*) is figured in Ratzeburg's 'Die Ichneumoniden' (vol. i., p. vi., fig. 10), and Curtis beautifully figures the female of *C. signatorius*, under the name of *bellosus*, on his plate 668. On plates 6 and 41 of Vollenhoven's 'Pinacographia,' thirteen species of *Cryptus* are well figured, including many details; nine of these are British. *C. antennatus* is badly figured in Trans. Ent. Soc., Lond., 1881, pl. viii., figs. 10, 10a. M. Boudier well illustrates the life-history of *C. migrator* in the plate accompanying his "Observations sur les habitudes de larves d'Ichneumon vivant aux dépens de la chenille du Bombyx du chêne" (Ann. Soc. Ent., France, v., pp. 357–365, pl. viii.). According to Boudier's observations the male *Crypti* emerged in May, 1834, from the smaller hole in the *B. quercus* cocoon (which was collected in October, 1853), and the eleven ichneumon

cocoons had their apices turned towards the point of exit; the females emerged from the larger hole, and there was a similar arrangement of the four cocoons; this is more clearly shown in figs. G, H, K and L of the plate. He described the species under the name of *Cryptus bombyci*.

The habits of the *Crypti* have already been so fully referred to that little further remains to be said. We have not confirmed Curtis's remark that *C. signatorius* "resisted the fumes of sulphur longer than any other insect that has come under my observation" (Brit. Ent., 668), either in this or any other species. The stinging powers of *C. obscurus* have been called attention to (Entom. xi. 35). The twice-recorded observation that *C. cimicis* has been bred from a cocoon which had produced the perfect *Trichiosoma* requires further elucidation (Westwood, Trans. Ent. Soc., Lond., 3rd ser., vol. i., p. lxxxvii; Bridgman, Entom. xi. 135). F. Boie's remark, on v. Winthem's authority, that *C. viduatorius* can run on the surface of water like a *Hydrometra* (Stett. Ent. Zeit., xvi. 94), is also perhaps worthy of note. Ratzeburg instances a remarkable case of accelerated metamorphosis: on June 4th, 1848, his wife collected a pupa of *Tortrix ribeana*, in a rolled apple leaf, to which an Ichneumon egg was attached; the larva appeared on June 7th, and spun up on the 14th, while a *Cryptus porrectorius* (*assertorius*) emerged on June 24th. This is very different to what he records of *C. echthroides*, and what we now know of *Mesostenus obnoxius*. Bouché describes the larvæ and cocoons of *C. titillator*, *C. peregrinator*, and his *C. emphytorum* (Naturg. der Insekten., pp. 142, 143). Brischke gives two species of *Cryptus* as hyperparasitic, viz.:—*C. nubeculatus*, as bred from an *Exetastes* cocoon; and *C. titillator*, as bred from the cocoons of *Campoplex pugillator* (Deutsche Ent. Zeits., xxi. 286).

Crypti are recorded as bred from four orders of insects, and from various spiders' nests. The following list refers to our known British species, but, from the extreme difficulty of correct identification of the species, many records must be taken *cum grano salis*.

1. *viduatorius*, *Fabr.* from *Eupithecia oxycedrata**; (Goosens) Giraud.
Nonagria typhæ?; Boie.
3. ? *erythropus*, *Gr.* „ *Emphytus cinctus*; Wilson.
4. *spiralis*, *Fourc.* „ *Talæporia pseudobombycella*; Siebold

6. *monticola*, *Gr.* from *Clostera anachoreta*; Taschenberg.
8. *tarsoleucus*, *Schr.* „ *Trachea piniperda*; Panzer. *Ammophila sabulosa*; (Siebold) Ratzeburg.
10. *cyanator*, *Gr.* „ *Arctia fuliginosa*; Gravenhorst. *Bombyx neustria*; (Roesel) Grav., (Graff.) Ratz. *Bombyx* cocoon in May; (Ritsema) Vollenhoven. *Diloba cæruleocephala*; (Bouché) Ratz. *Trachea piniperda*; Ratz. (*seticornis*). *Eumenes* sp. ?; Gir.
13. *parvulus*, *Gr.* „ *Emphytus cinctus*; Wilson.
22. *titillator*, *Gr.* „ *Ebulea sambucalis*; Bouché. Spiders' eggs; (Reissig) Ratz., Brischke.
24. *minator*, *Gr.* „ *Hylotrypes bajulus*; Ratz.
29. *Dianæ*, *Gr.* „ *Trachea piniperda*; (Muss.) Hartig (*leucostomus*).
30. *sponsor*, *Fabr.* „ *Agrotis valligera*; (Hartlieb) Grav. *Trachea piniperda*; Ratz. (*filicornis*). Xylophagous insects?; Nördlinger.
31. *obscurus*, *Gr.* „ *Zygæna filipendulæ*; Ratz. (*filipendulæ*, Boie.). *Bombyx quercus*; Grav., (Rogenhofer) Tschek, Gir. *Dianthœcia capsincola*; (D'Orville) Parfitt. *Tæniocampa cruda*; Marshall. *Hadena thalassina* or *Noctua plecta*; Sang. *Tenthredopsis* (*Tenthredo instabilis*); Marshall.
32. *arrogans*, *Gr.* „ *Trachea piniperda*; Brischke.
34. *leucostictus*, *Gr.* „ *Lophyrus pallidus*; Brischke.
36. *porrectorius*, *Fabr.* „ *Tortrix ribeana*; Ratz., Kaltenbach. *T. rosana*; (Goureau) Dours' Cat. *Depressaria nervosa*; (D'Orville) Parfitt.
37. *analys*, *Gr.* „ *Liparis salicis*; (Bouché) Ratz. *Saperda populnea*; Gir.
38. *rufiventris*, *Gr.* „ *Talæporia pseudobombycella*; (Drewsen) Thomson, Fletcher, ?(Reissig) Ratz. *Cemiostoma lotella*; Bond.
42. *adustus*, *Gr.* „ *Lophyrus pini* or *similis*; Brischke. *L. pallidus*; Brischke. *L. pini*; Hart. (*leucostictus*), *L. pallidus*; Brischke (*opioleucus*).
43. *confector*, *Gr.* „ *Osmia tridentata**; Dufour, (Frauenfeld) Tschek, Giraud. *Fœnus assectator*; (Giraud) Dours' Cat.
44. *nubeculatus*, *Gr.* „ *Psyche viciella**; Brischke. *Lophyrus pini*; (Graff, Brischke, Siebold) Ratz. *L. catocalus*; Voll.
47. *peregrinator*, *L.* „ *Ebulea sambucalis*; Bouché.
48. *tricolor*, *Gr.* „ *Pœcilocampa populi*; Parfitt. *Simyra venosa*; Eedle, (D'Orville) Parfitt, (Harwood) Big-nell. *Leucania* sp. ?; Parfitt. *Trichiosoma lucorum*; Parfitt.
- ornatus, *Gr.* „ *Sesia formicæformis*; Brischke. *Zygæna Ephialtes**; (Hartlieb) Grav. *Bombyx neustria*; Goureau, (Boog) Voll.

49. *fugitivus*, *Gr.* from *Smerinthus populi*; (Fallou) *Gir. (gracilis)*.
51. *migrator*, *Fabr.* „ *Macroglossa stellatarum*; Marshall. *Zygæna*
*Ephialtes**; (Brischke) Ratz. *Bombyx*
quercus; generally. *B. trifolii*; (Perris)
 Giraud, Brischke. *Lasiocampa pini**?;
 Nees. *Dicranura bifida*; (Reinhard)
 Tschek. *D. erminea*; (Richter) Grav.
D. vinula; (Drewsen) Ratz., Marshall.
*Plusia moneta**; (Richter) Grav. *Psyche*
*unicolor (graminella)**; Brischke. *P.*
*viciella**; Brischke. *P. atra**; Brischke.
Chalicodoma muraria; Tasch. *Trichiosoma*
lucorum; Reinhard, Marshall [cf. *cimbicis*].
Hylotoma rosarum; Tasch. *Eristalis*
sepulchralis; (v. d. Wulp.) Voll.
54. *fumipennis*, *Gr.* „ *Zygæna læta**; (Rogenhofer) Giraud. ? *Sa-*
turnia carpini; Barrett, Bridgman, Fitch,
 Meldola. *Psyche viciella**; (Rogenhofer)
 Tschek. *Trichiosoma lucorum*; Smith
 (B. M. Coll.) [cf. *cimbicis*].
55. *pygoleucus*, *Gr.* „ *Bombyx neustria*, *Dicranura bifida*, *Psyche*
*viciella**, *Lophyrus pini* or *similis*;
 Brischke.
56. *incubitor*, *Stroem.* „ *Euchelia Jacobææ*; Sang. *Saturnia carpini*,
*Psyche viciella**, *P. atra*; Brischke.
Trichiosoma lucorum; Brischke. *Cimbex*
variabilis; (Graff, Neuhaus) Ratz. *Hylotoma*
rosarum; Tasch.
57. *carnifex*, *Gr.* „ *Nonagria geminipuncta*; Voll., Brischke.
Leucania obsoleta; Brischke.
- elegans*, *Desv.* „ *Noctua*; (Drewsen) Thomson (*Drewseni*).
59. *signatorius*, *Fabr.* „ *Odynerus lævipès*; Curtis, Desvignes. *Osmia*
*tridentata**; Giraud. Old bramble stems;
 Bignell, Bridgman.
- cimbicis*, *Tschek.* „ *Cimbex variabilis*; Tschek. *C. amerinæ*;
 (Frauenfeld) Tschek. *Trichiosoma luo-*
rum; generally.
- dubius*, *Tasch.* „ *Emphytus cinctus*; Wilson.

LINOCERAS, *Tasch.*

Black; antennæ pale-ringed; femora and tibiæ red, apex of the latter black; tarsi pale testaceous. Male—face yellow. Female—antennæ tricoloured; aculeus shorter than abdomen.

1. *macrobatus*, $3\frac{1}{2}$ — $5\frac{1}{2}$ lines.

The long slender petiole at once distinguishes the species of this genus from all others of the family. Dr. Kriechbaumer's remarks on the synonymy of the genus, &c., must be consulted (*Ent. Nach.*, iv. 221, 251; v. 3). Although included in Desvignes'

British Museum catalogue, Marshall gives this species as doubtfully British. The National Collection contains one specimen from Desvignes' collection; and we have seen a fine male taken at Ventnor in July, 1867, by Mr. Pascoe. Dr. Giraud bred *L. macrobatus* from *Osmia adunca**, and Perris from a species of *Eumenes*; while Ratzeburg's *Acroricnus Schaumii*, which is certainly Gravenhorst's species, as pointed out by Kriechbaumer, was bred at the end of May, 1851, by Graff, from the nests of *Eumenes coarctata*. The male, with an enlarged cut of the metathorax, is well figured by Ratzeburg ('Die Ichneumonen,' iii. 92); and a good coloured figure of the female, the abdomen of the male, &c., is given by Vollenhoven ('Pinacographia,' pl. 6, figs. 1, 1a, 1b).

CYRTOCRYPTUS, Marshall.

Black; areolet minute; legs red. Male—face, front coxæ and trochanters white; hind coxæ brown. Female—antennæ white-ringed; aculeus one-third of abdomen. - - - 1. *brachycentrus*, 3—4 lines.

The abdomen of this species is almost sessile, giving the insect a very Pimplid appearance, hence Taschenberg's specific name (*pimplarius*); the areola is very small, and the aculeus very short. The female is well figured by Vollenhoven in 'Pinacographia' (pl. 41, fig. 5). This species is not uncommon in Britain; according to Dours' Catalogue it has been bred from *Saperda populnea* by Col. Goureau.

MESOSTENUS, Grav.

A. Abdomen red; petiole and apex black. (Male and female.)

a. 1st segment of abdomen not punctate.

Lines before and lateral margins of scutellum white.

1. *albinotatus*, 2½—5 lines.

b. 1st segment with deep coarse punctures.

* Hind femora and basal half of front and middle ones black; also the post petiole, except the red apical margin. 2. *obnoxius*, 2½—4 lines.

** Hind and front femora red; post petiole red. 3. *ligator*, 5½—6½ lines.

B. Black; scutellum yellow; antennæ pale-ringed. - *maurus*, 5 lines.

The small quadrate areolet is a readily distinguished mark of this genus. The sexes of the common *M. ligator* are beautifully figured by Vollenhoven ('Pinacographia,' pl. 41, figs. 1, 2); figure 4 of the same plate is not *M. obnoxius*. *M. gladiator*, Scop., which should occur in Britain, is probably the species referred to by Réaumur, and figured on plate xxix., figs. 1—10, of his

Mémoires; this species is well figured by Ratzeburg and Vollenhoven; it is parasitic on various fossorial Hymenoptera (*Pelopæus*, *Ammophila*, *Trypoxylon*, &c.), and, according to Giraud, on an *Osmia*. *M. maurus*, Marsh., is shortly described at Ent. Mo. Mag., ix. 241, from five specimens in the British Museum from Heysham's collection. Several species of *Mesostenus* are recorded as bred from old wood, sticks, &c., where they were parasitic on various aculeate Hymenoptera, or xylophagous Coleoptera. The life-history of *M. obnoxius*, bred from year-old cocoons of *Zygæna filipendulæ*, has already been fully referred to (Entom. iv. 125; xiii. 17). It has since been bred from these cocoons by many correspondents; while Brischke has bred it from *Z. filipendulæ*, *trifolii* and *Ephialtes**, and Giraud from *Z. carniolica (onobrychis)*.* Gravenhorst says that De Block bred many males of *M. ligator* from *Bombyx neustria*, Brischke bred it from *Zygæna trifolii* and *Cimex amerinæ*, and Giraud from *Acronycta rumicis*. This is not the only recorded instance of sawfly parasitism in this genus, as Goureau bred a species (*drapes*) from the globular, *Nematus*, willow galls.

NEMATOPODIUS, Grav.

- A. Black; thorax partly red; extreme margins of segments, scutellum, mouth, face, orbits and marks on thorax white; femora, front tibiæ and tarsi red; front coxæ and trochanters white. (Male and female.)
 - 1. *formosus*, $3\frac{1}{2}$ —6 lines.
- B. Black; legs pale red; hind tibiæ and tarsi fuscous. (Male and female.)
 - ater*, $2\frac{1}{2}$ — $3\frac{1}{2}$ lines.

Gravenhorst says this genus is intermediate between *Cryptus* and *Echthrus*, while Taschenberg remarks on its resemblance to *Ischnus*. *N. formosus* is given by Marshall as reputed British; we only know the single specimen in the National Collection. This species is well figured in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 24). Taschenberg says, "In June and July of every year I find this beautiful species on a barked oak stump" (Hym. Deutsch., p. 58); this was at Halle. *N. ater*, Brischke, is alluded to as British at Trans. Ent. Soc., Lond., 1882, p. 145; it has since been bred in some numbers from *Emphytus cinctus* by Mr. T. Wilson, of York.

LIFE-HISTORY OF *NYCTEMERA ANNULATA*.

BY G. VERNON HUDSON.

LIFE-HISTORIES of New Zealand insects will probably interest some of your readers. Several have come under my notice during the past year, but the most complete I have as yet observed is that of *Nyctemera annulata* and its parasite, an account of which I here give.

This insect continues to pass through its stages without interruption during the whole year. Its development, however, progresses much more rapidly in the warm than in the cold season; it consequently is to be found in all states at any time, but the perfect insect is very scarce in the depth of winter. The eggs are semiglobose in shape, and of a whitish yellow colour; they are deposited on the leaves of various species of plants, the most usual being a light green kind of ivy with yellow flowers. They are apparently quite smooth and destitute of sculpture. When the young larva first emerges it is about 1 line in length, and as thick as a piece of ordinary thread. Unfortunately I have not observed the exact number of moults this larva undergoes, but should judge it to be about six. The following is a description of the caterpillar when full grown:—Length, about 15 lines; head black and shining, of a moderate size; body elongate, slightly tapering at each end; general colour black, with a reddish interrupted line down the back and one on each side; the articulating membrane of the segments slate-coloured, and also the ventral surface. In younger larvæ there are several slate-coloured lines extending the whole length of the insect, and thus dividing the black into squares. Round all the segments in the middle, at their greatest circumference, are a variable number of brilliant blue warts, out of which dense tufts of long black hair take their rise; there are no warts on the extreme ventral surface. Prolegs on the 7th to 10th and 13th segments; legs short, black and shining. This description applies very well as a rule, but the larva is subject to many slight variations. It remains in this state for nearly three months, or more, according to the season, and is very common, numbers being found on the different plants which constitute its food.

The only parasite which I have as yet observed attached to

this insect is a member of the Diptera, viz., *Chlorogaster ruficeps*. This fly evidently deposits its eggs on the skin of the larva, as it possesses no ovipositor, but simply that organ known as the tube, which is entirely unfitted to penetrate the skin. I have not, however, been fortunate enough to detect the insect ovipositing, and therefore speak only from supposition. The caterpillars infested are apparently quite as healthy and active as the rest; they even change into pupæ before the parasite emerges. A few days after the change the maggot eats its way out of the hard shell, and turns into a dark brown coarctate pupa, with scarcely any trace of articulations. The perfect fly appears in about six weeks; and is chiefly remarkable for the agility of its movements, and its very large pearly white scales, which render it very conspicuous. In the two cases which I have observed the numbers in the caterpillar were one and two respectively.

The pupa (of the moth) is from 6 to 8 lines in length; it is of a shining black colour, with many longitudinal rows of small yellow blotches on the abdominal segments; there is also a stripe of the same colour at the tip of the wing-case. It is enclosed in a slight cocoon formed of a mixture of silk and hair, and is attached near the ground to any firm object; from this the moth proceeds in the course of a month or six weeks (sometimes considerably longer).

The perfect insect is very common, being found profusely in the neighbourhood of its food-plants. It is of a uniform black colour, with the posterior margins of the abdominal segments yellow; there are also several yellow marks on the thorax. The anterior wings have a band of three cream-coloured spots near the lateral margin, which vary very much in size, and are frequently almost coalescent. The posterior wings have one round spot near the centre. Antennæ strongly bipectinate in the male, slightly so near the base in the female. Expanse from 12 to 18 lines.

This insect is diurnal in its habits, few being found about at night. Its flight is very feeble, and somewhat resembles that of the well-known British *Satyrus janira*.

Thackwood, Uakapuaka, Nelson, N.Z., October 3, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ARGYNNIS DIA NEAR TUNBRIDGE WELLS.—It will doubtless interest many of your readers to learn that this insect has been taken in this county. The fortunate captor was Mr. J. C. Arnold, of Hastings, who took the insect near Tunbridge Wells some years ago, but did not then know what a prize he had secured. He had supposed it to be *A. selene* or *A. euphrosyne*, but on comparison lately found it did not agree with either species, but agreed well with the very short description of *A. dia* in Coleman's 'British Butterflies.' The question now arises: First, is this specimen really *Argynnis dia*? Secondly, was the specimen taken near Tunbridge Wells? Both these questions may, I think, be answered unhesitatingly in the affirmative. That it is an example of *A. dia* is certain, for it agrees exactly with specimens sent to me by Mr. Meek for comparison. Mr. Arnold well remembers taking it, and observed at the time that the under side looked rather dull, faded he supposed, but did not in the least guess that it was anything out of the common.—E. N. BLOOMFIELD; Guestling Rectory, Dec. 30, 1882.

VANESSA C-ALBUM IN NORTH WALES.—In face of the recent evidence (Entom. xiv. 250) as to the probable extinction of this lovely species, I am pleased to record the occurrence of the autumn brood near Llandudno, and at Colwyn Bay. Whilst out collecting *Satyrus aegeria* for varieties, of which I netted several on Sept. 5th, I was delighted to meet with a fresh specimen of *V. c-album*. The locality was a rough piece of ground covered with blackberry, surrounded by an oak-wood, and I noticed for the first time that the insects were very fond of sailing round the tops of the trees, and alighting far out of reach, where it was most tantalising to watch them securely enjoying the sunshine. However, they occasionally descended to the bushes, like *Thecla quercus*, and I managed to box a fine series. They are very powerful on the wing, and a specimen once missed is not likely to be seen again the same day.—MARTIN J. HARDING; Cottisbrooke, London Road, Shrewsbury, Oct. 18, 1882.

COLIAS EDUSA IN ESSEX.—As it is desirable that the fitful appearances of this species should be recorded, I beg to state that I have seen three specimens this year (one of which I caught)

at Roxwell, near Chelmsford.—REGINALD W. CHRISTY ; Boynton Hall, Chelmsford, Dec., 1882.

PIERIS BRASSICÆ LARVÆ AT CHRISTMAS.—On Christmas Day, 1881, I obtained several larvæ of *P. brassicæ* feeding on broccoli in my garden, and they continued feeding for several days. I thought this rather unusual, and made a note of it, but set it down in my own mind to the excessive mildness of the season. On December 10th, 11th, and 12th this year I registered an average of twelve degrees of frost. Yet, after the thaw had set in on the 13th, I counted fifteen larvæ of *P. brassicæ* on the 14th, and have observed some daily up to yesterday, Christmas Day, 1882.—A. C. HERVEY ; Titchfield, Hants, Dec., 1882.

CHARIS ZABUA, *Gosse*, = LEMONIAS TENELLUS, *Burm.*—In my article in the 'Entomologist' for September, 1880, entitled "The Butterflies of Paraguay and La Plata," I described (Entom xiii. 202 ; pl. 2, fig. 5) and figured a small species which I named *Charis zabua*. I believe, however, that it is identical with the insect previously described and figured by Dr. Burmeister, in the 'Descr. Phys. de la Rep. Arg.,' p. 224, Atlas, pl. viii., figs. 8 A, B, under the name *Lemonias tenellus*.—P. H. GOSSE ; Torquay, January, 1883.

LEPIDOPTERA OF THE CHANNEL ISLANDS.—Having lately been on a visit to the Channel Islands, I was much surprised to find Lepidoptera very scarce there. During our stay, from September 27th to October 10th, we observed the following species only, none of which could be called numerous:—*Pieris rapæ*, *P. brassicæ*, *Vanessa atalanta*, *V. urticæ*, *Satyrus ægeria*, *Chortobius pamphilus*, *Polyommatus phlæas*. Besides these few species we saw the larvæ of *Bombyx rubi*, *Hadena pisi*, and a species of *Lithosia*. *Satyrus ægeria* and *Chortobius pamphilus* were fairly common. One would expect to find such species as *Colias edusa*, *Gonepteryx rhamni*, *Vanessa cardui*, and *Lycæna icarus* still on the wing at the beginning of October in the Channel Isles, as the season lasts longer out there, but not a vestige of them did we see. Was this scarcity of Lepidoptera owing to a day or two of rough weather we had, the time of year, or to the general paucity of insects this season ? I may mention that there were plenty of flowers in the gardens. We found woodbine still in flower in the hedges, and the ivy in the lanes was also in bloom.—ALFRED SICH ; Burlington Lane, Chiswick, Oct. 19, 1882.

LEPIDOPTERA NEAR CROYDON.—The past season for Lepidoptera, especially Diurni, has been an exceptionally bad one in this neighbourhood, Croydon. I will give, however, an account of some which I have taken this year. *Gonepteryx rhamni* has been fairly plentiful, both the hibernated and autumn broods. *Anthocharis cardamines* was very abundant in a lane adjoining Chattenden Woods, Kent; I took twelve males within a space of a few yards in a few minutes, and out of sixteen taken there was one female only. I think the females seldom fly, which accounts for their scarcity compared with the males. Although so common in the above-named place this year, this species has been rare about this locality. *Satyrus semele* used to occur abundantly on a piece of rough chalky ground near Croydon, but during the last three seasons it has not been seen; the same with *Setina irrorella*, which was formerly very plentiful. *Lycæna adonis*, not one this season. A very few *L. alexis* and Hesperidæ were observed. *Vanessa io*, from some cause, seems to be almost exterminated; this year I have not seen a single specimen. *V. atalanta*, a few seen; not one *Pyrameis cardui*. *Vanessa urticæ*, abundant everywhere; I reared several dozen this season for varieties, but not one differed from the type. On July 1st, a splendid day, in company with a friend, I visited three different places, and hardly a butterfly was to be seen, excepting a few *Satyrus janira* and *Cænonympha pamphilus*, which is a fair average of observation during many days' collecting this year. *Lycæna corydon* and *Argynnis euphrosyne*, as usual, were very abundant; the former on August 12th in profusion, the females in much greater quantities than the males, the opposite being generally the case. *Brephos parthenias* was early and abundant, fully out on March 13th and 17th; I took a large number each day; on the latter day I saw one hibernated *Vanessa polychloros*, the only one this season. It seems to be a rare species in this neighbourhood; while at Ipswich, in 1872 and 1873, it was one of the commonest butterflies; since that time I have only taken one in this locality. The following captures may be worthy of record. Last year, July 7th, I took a fine female *Stauropus fagi*, at rest on a Scotch fir trunk. One larva of *Notodonta chaonia* from oak, which emerged an imago on April 12th last. I also captured, last May 13th, *Sesia cullici-formis*. I tried assembling for *Saturnia carpinii* several times in April and beginning of May last, but not one was to be attracted

by the lady's charms. *Satyrus hyperanthus* and *S. tithonus* have disappeared from some places where formerly they occurred commonly. I have two *Dicranura vinula* and *Acronycta mega-cephala* pupæ, which have been in that state since last July twelvemonths, and are as lively as ever, which, I think, is unusual for the species. I should like to hear if others have found this the case with any other pupæ this year?—FRED. W. FROHAWK; Upper Norwood, Surrey, December, 1882.

LEPIDOPTERA IN SOMERSET.—I beg to send you a report from Somerset as to the past season's doings. I have collected insects for more than forty years, and do not recollect one season in which they were so few, and, although at the commencement of the summer some of the more common were fairly plentiful, the later year failed to carry out the earlier promise, for at sugar only two insects were at all plentiful, *Phlogophora meticulosa* and *Polia flavocincta*. Not only were the scarcer *Xylina semibrunnea* and *X. petrificata* absent, but such common visitants as *Triphæna pronuba*, *T. orbona*, *Mamestra brassicæ*, *Agrotis segetum*, &c., were either very few or entirely absent. *Cerastis spadicea*, which generally occurs by dozens, was this year represented by two specimens, both taken in November.—H. W. LIVETT; Wells, Somerset.

RETARDED PUPATION OF BOMBYX QUERCUS.—On the 17th December last I reared a specimen of *Bombyx quercus* which had remained in the pupa condition since 1879. This seems very singular, and may account to some extent for our late bad seasons. I have still two pupæ of 1881 alive and well. It would be interesting to know if the same thing is occurring in a state of Nature.—C. K. TERO; B 32, Kent Street, Grimsby, Jan., 1883.

CUCULLIA ABSINTHII IN SOMERSET.—While collecting at Minehead in August, 1881, I discovered a large number of the larvæ of this species feeding on *Artemisia absinthium* in a lane near the village of Alcombe. In three or four visits I collected thirty-four, about one-fourth to three-fourths of their full size. On the 8th of September, when I had to return to London, four had burrowed; the rest were carefully taken to town, with a large quantity of the *Artemisia* potted, but every one died. This is perhaps due to the London atmosphere, but more probably to the fact that the flowers of their food-plant, which they alone ate, were almost exhausted. Of the four remaining cocoons, two were

dead by the spring, and the other two did not emerge. On the 13th of September in this year I sent them to the Insect House at the Zoological Gardens to be forced, having no means of doing so myself. One emerged on the 30th of November, after a pupal state of fifteen months; the other is still alive, but has not yet emerged. Having found no satisfactory figure or description of the larva, I append the following:—The full-grown larva is stout, with the segmental folds deeply indented. The head is greyish, freckled with green, and is rather narrower than the 2nd segment, which is pale grey, mottled with brown. The ground colour is green. On each segment, and on either side of the dorsal line, there are two tubercles arranged transversely on the 2nd, 3rd, and 4th segments, and in a trapezium on the others, as in the larva of *Cosmia trapezina*; there are also two in the spiracular line on each segment. All these emit a single bristle. The dorsal line is pale grey, widened towards the hinder part of each segment. Each tubercle is in a brownish area, and the two front ones on each segment are connected with the hinder pair on the preceding segment by an indistinct green stripe, rather darker than the ground colour. The spiracles are pale, with a dark ring, and are very inconspicuous. There is a pure white stripe beginning at the front of each segment in the spiracular line, and extending obliquely to the claspers, which, with the legs, are white and resemble porcelain. The ventral surface is streaked and mottled indistinctly with white. The larva feeds openly by day on the flowers of *Artemisia absinthium*, which it greatly resembles. It eats only the receptacles, and makes a very large pile of *débris* under its food. It sits when at rest with the 5th segment humped, and, if disturbed, it jerks itself from side to side, or rolls in a loose ring with the head and tail protruding.—W. F. BLANDFORD; 71, Grosvenor Street, London, December 30, 1882.

SUPPOSED OCCURRENCE OF *ANARTA MELALEUCA* IN SCOTLAND. —In a very carefully-formed collection of British Lepidoptera that has recently been purchased by me appears a male of this species, placed in lieu of its congener of that sex, *Anarta melanopa*; the remaining series (five) being females of the latter. Unfortunately the gentleman who took them is deceased, but I am informed upon unquestionable authority that all the Scotch insects in the collection were taken by himself about eight years ago. The fact is worth recording in case the species should again be

found by the northern collectors.—WILLIAM WATKINS; Shepherd's Bush, London. W., Jan. 3, 1883.

DESCRIPTION OF THE LARVA OF PETASIA NUBECULOSA.—I have never seen this larva alive, but some time ago Mrs. Cross, of Appleby Vicarage, Brigg, sent me a preserved example (one of six she had obtained from Rannoch), which she said was a very good specimen. As such was evidently the case I took down a description of it as follows:—Length towards two inches, and of average bulk; the head has the lobes rounded, and is slightly narrower than the 2nd segment; body cylindrical, and of about equal width throughout; the skin is rather deeply wrinkled transversely, and the wrinkles, with the large raised tubercles, together with a prominent transverse ridge, surmounted with two tubercles on the 12th segment, give it an uneven appearance; a short hair springs from each tubercle. The ground colour is a beautiful bright pale green; head of a slightly darker shade, except the space above the mandibles, which is pale greyish green; on each side of the 4th segment is a rather broad oblique yellow stripe, and there are indications of similarly coloured stripes, but very much fainter, on the following segments; tubercles bright yellow; spiracles large, oval, greyish white, surrounded with intense black; legs light brown, green at the jointal divisions; prolegs green, tipped on the outside with very dark chocolate-brown. Feeds on birch.—GEO. T. PORRITT; Huddersfield, Jan. 2, 1883.

[We are obliged to our correspondent for this description, but doubt the advisability of describing larvæ of lepidopterous insects from preserved specimens.—ED.]

EBULEA STACHYDALIS IN THE ISLE OF WIGHT.—Last July I captured a fine female *Ebulea stachydalis* here, which I gave to Mr. Bond. I took another specimen eight years since, which I had mixed up with *E. sambucalis*, and there most likely it would have remained had not Mr. Dale, of Glanvilles Wooton, recognised it amongst the others three years since. The past year proved the worst for collecting that I have known during the forty years I have collected here. I met with a fair number of *Acherontia atropos* in the larva and pupa state, but all died, although I treated them in exactly the same way as I did some others thirty years since. About that time I bred 130 in one season from larvæ and pupæ found in Freshwater.—H. ROGERS; Rosebery House, Freshwater, Isle of Wight, Jan. 10, 1883.

YPSIPETES ELUTATA.—Present observations of mine bearing on the controversy engendered by Mr. J. Jenner Weir's notes on *Ypsipetes elutata* as a heath-feeder, may interest the readers of the 'Entomologist.' In the month of August, 1881, I was staying at Glendevon, a mountain hamlet in Perthshire. Being out one evening on a heath-covered hill in that neighbourhood I observed that *Y. elutata* literally swarmed, and that the prevailing form was smaller and darker than that found in the low-lying parts of the same district. There can be no doubt that heath is the food-plant, as the bilberry does not grow there, and there are no hedgerows and few trees of any kind, except fir, and even these are at a considerable distance from the place noted. Again, about the end of June last year, I was out sugaring with a friend near here, but, the night proving unproductive, we commenced to search the ling and bilberry, of which there is a heavy undergrowth, for larvæ. Two species occurred in abundance, and these were *Cidaria populata* and *Ypsipetes elutata*, of each of which we took at least three dozen, the former invariably from bilberry, and the latter almost invariably from ling (*Calluna vulgaris*), thus proving that in this district *Y. elutata* prefers the ling to the bilberry.—JAMES HINCHCLIFFE; Stirling Street, Alva, Stirlingshire, N.B., January 15, 1883.

REMARKS ON REARING LEPIDOPTEROUS LARVÆ IN CONFINEMENT.—A great deal has been written from time to time on rearing larvæ in confinement, and several methods have been advocated as the best. It is an undoubted fact that larvæ of different genera and also of different species require various kinds of treatment. Some are brought to maturity with comparative ease, whilst others perish, though watched with the greatest attention, and treated with the utmost care. That very excellent and able paper by Mr. C. G. Barrett in last month's Ent. Mo. Mag. (vol. xix., p. 172) on rearing *Tortricidæ* will show how difficult many of that family are to rear. It is not my intention in this place to dwell upon the difficulties of rearing larvæ, but only to explain the mode I adopt when rearing them, and the best means of keeping them healthy and within bounds. The tedious process of tying muslin or linen over flower-pots and jars is by my plan avoided, and consequently much time saved. I keep the larvæ in wide-mouthed glass bottles; those in which the anchovies of the Compagnie de la Méditerranée are sold I think

are the best, and for many years I devoured multitudes of those delicious little fish, both for breakfast and at dinner, not so much from the desire of satisfying my epicurean taste, as for obtaining the bottles afterwards for larvæ. These glasses are about $6\frac{1}{2}$ in. high and $3\frac{1}{4}$ in. diameter across the top, and, as they are of clear glass, the habits of the larvæ can be observed with great facility. At the bottom I place a sufficient quantity of baked sand, damp enough to suit the larvæ, but not so much so as to cause mould; on this I place baked moss, more or less, according to what I consider the requirements of the larvæ; then comes the food-plant, and this is not unfrequently planted in the damp sand. But now comes the plan adopted instead of tying on the muslin or linen covers: I procure a number of wire rings, made of the ordinary fencing-wire, and these are covered with tarlatan, muslin, net, or any other material, according to the texture required; these rings, when covered, are most convenient to use, as they have only to be taken off and put on, and the ring is made of such a size as to fit easily over the mouth of the jar; and, if a thicker and heavier wire were used in their construction, and they were made to fit well, I believe they would baffle some of Mr. Barrett's *Tortricidæ*. In the case of some of those larvæ, such as *Cossus ligniperda* and others, which cannot be kept under restraint by cotton or linen fabrics, I have the rings covered with perforated zinc, and for smaller larvæ, such as the *Sesiidæ*, &c., with very fine iron-wire gauze.—OWEN S. WILSON; Carmarthen.

A WASP IN WINTER.—If, as I believe, it is a rare occurrence, some of your readers may be interested to hear that a queen wasp came into the house last Friday (Dec. 29th), and must have remained concealed somewhere, for early the next morning she killed herself by flying into the flame of a candle on the dressing-table. Friday was a very wild but dark and rainy day here, not one on which I should have expected to see a wasp about even some months earlier in the season.—(Miss) ELEANOR BAYLEY; Hurstpierpoint, Jan. 1, 1883.

[The female wasp had no doubt been hybernating in the neighbourhood, and had probably been disturbed while in a semi-torpid state, brought about by the exceptionally warm weather we have lately experienced in the South of England.—ED.]

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NOTES ON THE GENUS *HEMIMACHUS*, RATZ.

BY JOHN B. BRIDGMAN.

THIS genus, which was separated from *Hemiteles* by Ratzeburg (Ichn. d. Forst. iii., 157), has in reality no right to a separate existence, as the insects of which it is composed are only the males of *Pezomachus*. It is an extremely difficult group, from the imperfectness of the older original descriptions. I shall in this paper consider the species quoted in Mr. Marshall's 'Catalogue' of British Ichneumons.

The first is *H. palpator*, Gr., which is given as the male of *P. trux*, Foerst. There is little doubt that under the heading of *Hemiteles palpator* several male *Pezomachi* are mixed; Ratzeburg says (*l. c.*) that the male which he describes as *Hemimachus fasciatus* is probably var. 1 of *H. palpator*, Gr., male; it certainly agrees fairly with the description, which is only as to colour, but after this short description he says, "Cætera sicut in maribus plurimis genuinis," showing that they vary. The next species which Ratzeburg describes (*H. pezomachorum*) he says is nearly allied to *H. palpator*, Gr.; he also describes another species, under the name of *H. variabilis*, of which Hr. Brischke, says (Schrift. d. nat. Ges. in Danzig, 1876) is *Pezomachus cursitans*, male = *variabilis*, Ratz., = *palpator*, Gr.. Unfortunately, although Ratzeburg gives a good description of the colour, he gives none of the structure, or even says of it, as he does of the other two species mentioned, that it is like *H. palpator*, Gr., but he gives Hr. Brischke as the authority, he having bred the two varieties described from *Psyche* cases. Ratzeburg

says one has the thorax partly red. This variety of coloration is not mentioned by Gravenhorst or Taschenberg ('Die Schlupf-wespen-familie' Cryptides'); the latter only describes one of Gravenhorst's males: this certainly agrees with Brischke's description, but neither makes any mention of the pubescence on the abdomen, whether dense or scattered, which is unfortunate, as this appears to be a good specific characteristic of the female, and will probably be so in the male also. In Mr. Marshall's collection the male *Pezomachus*, under the name of *H. trux*, Foerst, which in his catalogue is given as *H. palpator*, Gr., male, agrees fairly well with *H. palpator*, but from the shortness of the descriptions it is impossible to say if they really are the same species. I have in my collection four males, which agree very well with all these descriptions; they were bred from two hosts, two from one and two from the other, and were given to me by two entomologists; although very much alike they are, I have no doubt, two distinct species, but either would answer to any of the above descriptions. Unfortunately no females were bred with them, or from their obscure appearance and fleetness were not detected.

Associated with Mr. Marshall's male *Hemimachus trux* were three females mounted on card, and from the writing beneath evidently came from Mr. J. E. Fletcher, of Worcester, and I have no doubt formed part of the eight females bred by that gentleman from *Coleophora vibicella* (see Ent. Mo. Mag., viii., 162). On examination I think Mr. Marshall must be mistaken in the species, or at any rate the association of the male and female is not satisfactory, as of the three females two belong to one species and the other to a very distinct one; of the two the pubescence on the abdomen is scattered, whereas Foerster says of *P. trux* the pubescence on the abdomen is dense; these appear to me to come near *P. insolens*, Foerst. The other specimen has the pubescence on the abdomen dense, but has not, as Foerster says *P. trux* has, the spiracles on the first segment of the abdomen projecting very much; it appears to me to come in Foerster's Div. iii., and just before *P. fallax*. I have taken this latter species near Norwich, and can make it agree with none of Foerster's species. There being two females mixed, it is impossible to say to which the male belonged.

The next species occurring in the catalogue is another

confused species, *Hemiteles rufocinctus*, Gr., which Mr. Marshall gives as = *Hemimachus rufocinctus*, Ratz.; this Hr. Brischke (*l. c.* 1878, p. 203) denies, and says they are different species, and that *Hemimachus rufocinctus*, Ratz., is the male of *P. instabilis*, Foerst. The insect which stands in Mr. Marshall's collection as *H. rufocinctus*, is according to Taschenberg (*l. c.*) not *Hemiteles rufocinctus*, Gr., and it certainly is not *Hemimachus rufocinctus*, Ratz., but quite a distinct, and I believe undescribed, species. *Hemimachus rufocinctus*, Ratz., has a finely-bordered, elongate, pentagonal, supero-medial area on the metathorax, and the abdomen clothed with scattered pubescence. *Hemiteles rufocinctus*, Gr., according to Taschenberg, has two transverse lines on the metathorax, but no supero-medial area, it wanting the longitudinal lines to complete it; he does not mention the state of the pubescence on the abdomen. Mr. Marshall's specimens have a very short metathorax, without a trace of a supero-medial area, and only the posterior transverse line present, and that only defined at the sides; the pubescence on the abdomen is very dense, differing thus from the true male and female of *P. instabilis*. This species has also been taken by Dr. Capron, to whom I am indebted for a specimen.

The next species, *H. fasciatus*, Fabr., I have already mentioned; there is no doubt about this species, it having been so frequently bred.

The last, *Hemimachus avidus*, Foerst, has amongst its synonyms *Hemimachus albipennis*, Ratz. (*l. c.*) as a winged form. Hr. Brischke says (*l. c.*, 1876) that he "bred *Agrothereutes hopei*, Gr., from cases of *Psyche viciella*, and later a *Hemimachus albipennis*, Ratz., and on comparison there is no doubt but that they belong to the same species." I do not consider this quite conclusive, as often various parasites are bred from the same host, as proved above; and generally speaking the male is the first, not the last, to appear. Hr. Brischke also says probably *A. hopei*, Gr., is only a variety of *A. abbreviator*, Gr. Thomson (*Opusc. Ent.* p. 504) under the name of *Spilocryptus dispar*, Thoms., says the female = *Pezomachus* = (*Agrothereutes*) *abbreviator*, Gr., and the males = *Cryptus pygoleucus*, Gr.

Having in the above remarks endeavoured to show the difficulties that enshroud the genus *Pezomachus*, I would earnestly plead to the breeders of Lepidoptera, to assist in clearing up

these difficulties. The case-bearing larvæ (*Psychidæ*, *Coleophoræ*, &c.) appear to be special favourites of these parasites. The obscure appearance of the majority of the small *Pezomachi*, both male and female, renders close observation necessary to detect them when they have been bred; I have no doubt many escape without having been noticed at all, especially the females, which look like small ants. The best way to secure them would be to remove the cases, after the larvæ have finished feeding, into glass-topped boxes or corked bottles. I shall be very thankful for any specimens that may be sent to me, and should like to have them as soon after death as possible; if packed in a small piece of paper damped with water, to which a trace of carbolic acid has been added, they would reach me in a condition which would enable me to set them carefully, without which they are almost useless.

69, St. Giles's Street, Norwich, Feb. 1883.

REMARKS UPON CAUSES OF SCARCITY OF LEPIDOPTERA.

BY W. FRANCIS DE V. KANE.

I HAD hoped that ere this some entomologist of note would have offered some explanation of the phenomenal scarcity recorded from all quarters during the past season.

The following suggestions, however, are thrown out to invite comment.

My experience in several parts of Ireland, and that of correspondents (notably Mr. Russ, of Sligo, who has obliged me by very full notes of his captures in that neighbourhood), harmonises remarkably with that of most English collectors. When it is remembered that the preceding summer of 1881 was rather more genial and sunny than usual here, and the harvest abundant, while in England the reverse was the case, it is evident that the general failure cannot be accounted for by the absence of sunshine at that period.

The open winter of 1881-82 was, however, common to the whole of the United Kingdom, and doubtless slugs, centipedes, beetles, and birds wreak more havoc in mild winters on exposed and unprotected pupæ, while frost is innocuous to them. However, there are parts of Great Britain, such as the Isle of Man,

South Devon, and the South and West of Ireland, with an abundant entomological fauna, where the winter climate is normally such as that in question. This cause could, therefore, in any case only account for the comparative dearth of some species, while the Hepialidæ, and such species as *Charæas graminis*, which have subterraneous larvæ and pupæ, would be as numerous as usual (as was my own experience, and that of others; see Mr. Corbett, in Entom. xv. 236); yet many species which have subterraneous or well-protected pupæ, such as *Dicranura vinula*, &c., were also abnormally scarce. We must, therefore, look for a further cause.

Cause 2. There was one characteristic of the summer of 1881, as well as the succeeding autumn and spring, which I think goes a long way toward explaining the dearth of (1st) such forest insects as have arborivorous larvæ (for it is, I think, in this section the scarcity seems to have been most marked), and (2ndly) of some coast insects in certain exposed localities: I refer to the succession of high winds and storms. For such larvæ as feed exclusively on tree foliage, when shaken down, perished (with the exception of Tortricidæ, whose rolled-up shelters would protect them,—*T. viridana*, for instance, is reported to have been very abundant), whether in summer, autumn, or after hybernation in the spring; while such as live on bushes or low-growing plants, or on such trees as the willow, sallow, alder, or birch, which are frequently found on bushes or in hedgerows, were, on suitable nights, not only plentiful, but unusually so. *Bryophila perla* (Mr. Salwey, Entom. xv. 198) and many of the lichen-feeders were reported as abundant; Tineina pretty plentiful, *teste* Mr. South (Entom. xv., pp. 154, 155), Mr. Corbett (p. 236), Mr. Tugwell (p. 205, *Lithosia pygmæola*), Mr. Bird (p. 235), Mr. Atmore (xvi., p. 12), and others. Marsh insects and internal feeders I also noticed were in normal abundance on fine nights. Mr. South also indicates another result of the stormy season (p. 154), which destroyed not only the tree foliage in an exposed locality, but also the surrounding herbage. Mr. Tugwell illustrates the same in his complaint that he could find but few flowers and seed-pods of *Lychnis* or *Silene* at Dover. I observed the same at Howth and the Isle of Man, where the *Silene maritima* had likewise suffered by the wind. This accounts for the rarity of *Dianthœcia cæsia* and *D. capso-*

phila there, both imago and larva (Mr. Thorp speaks of *Silene inflata*, sic? p. 237); and at Douglas I learnt that none had been taken at the lighthouse in consequence of the wind. I took, however, larvæ of *Sesia philanthiiformis* in July, Mr. Thorp having failed to find it in June, which illustrates another peculiarity of the season, to which I shall again refer. Lastly, I note that Mr. M'Rae speaks of "extensive defoliation in the New Forest" at Midsummer, 1881. To this cause, therefore, I attribute chiefly the actual scarcity of Lepidoptera, which, as I noticed, was most marked in certain tree-feeding species.

Cause 3, of the want of success of most collectors, I think, was the unusual atmospheric conditions throughout the season of capture, coupled with the derangement of the usual time of appearance, for the unusual warmth of the spring induced a very early apparition of insects; and, on the other hand, about the middle of June a sharp frost occurred, which ushered in a period of cold, ungenial, wet weather, causing the summer imagines to be as late as those of the spring were early, and the larvæ of slow development. I endorse, therefore, Mr. Bull's experience (Entom. xv. 192), that of the Rev. Seymour St. John, and others, in spite of Mr. Carrington's evidence to the contrary from Huntingdonshire. On several nights in May I took large numbers of Macros at sugar, while on June 3rd I captured ninety specimens of nineteen species, out of twenty-five species observed, and left off from sheer weariness before the flight had shown signs of abatement. Bearing the above in mind it is easy to see how excursionists or temporary visitors to well-known localities would be baffled by the delay or precocity of emergence of expected species. Moreover, the character of the season was, as Mr. South remarks, "eccentric" and fickle, suggesting the possibility of electrical disturbance as being a factor in the results, as doubtless it is in other domains of zoological experience. I found that only an average of one out of eight nights was fairly productive, either at light, sugar, or ivy, throughout the season, even where there was no failure of many species. A week's visit to a locality might, therefore, be no sort of a criterion of failure or abundance of Lepidoptera there. As to Rhopalocera the cold and wet of the summer prevented their flight, and that of day-flying moths, such as *Stenia irrorella*; but in the spring there seems to have been no scarcity. Mr. M'Rae's experience at Bournemouth, however,

baffles me, and may, I venture to suggest, have arisen from local causes; the rather as I see he reported a like scarcity there during the latter portion of the season of 1881. He writes:—"Both herb- and tree-feeders have been equally scarce, and, when the result of one's collecting is *nil*, it is scarcely possible to institute a comparison."

Sloperton, Kingstown, Co. Dublin, February, 1883.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By REV. W. W. FOWLER, M.A., F.L.S.

No. XII.—GENERAL BEATING AND SWEEPING.

WE now come to rather a wide part of our subject, which cannot be much more than touched upon,—general beating and sweeping. In numerous forms it has already come in in other papers, but yet requires a few words for itself.

The best form of sweeping-net (a deep gored net, furnished with small rings round the edge that slip over the large metal ring which screws into the stick) has already been described (Entom. xv. 61). An umbrella serves all the purposes of a beating-net, but it is better if the whole space just above the ribs is covered with calico or some light material, as else minute species will often get into and under the ribs, and be lost.

In sweeping and beating several circumstances have to be taken into account,—the time of year, the time of day, the general temperature, the direction of the wind, the kind of ground, and the flora of the locality.

As a rule nothing much is got by sweeping or beating before April, certainly not in the northern counties; occasionally, however, a warm day will tempt out hibernating species. On March 18th, last year, I swept a considerable number of Staphylinidæ, Halticidæ and Curculionidæ, and a few Hemiptera, in a wood near Lincoln. Sweeping is productive much later in the year than might be expected: on a foggy afternoon in autumn—when everything has been soaked with moisture, and the sweeping-net has been as wet as if dipped in water—I have swept up many good things in Bretby Wood, near Repton; *Anisotoma grandis*, perhaps, being the best species I ever took in this way.

From the last week in April to the first week in July, and again from the last week in August to the last week in September, are, perhaps, the best times of year for beating and sweeping. Even in the best localities the month of August, especially the beginning of it, is most unproductive; and I have found in the New Forest that at this time hardly enough was obtained to be worth the working; the reason of this evidently is that the first broods have disappeared, and the second broods begin to come again at the end of August. The best time of all may be said roughly to be from May 20th to June 20th, and a day at this time will often prove of more value than a week at any other.

As regards the time of day it is best to begin early; it is rather inconvenient to get one's net thoroughly soaked with dew to begin with, but the good species that may be obtained make it worth while to carry another net, although this is not necessary, for as soon as the dew disappears the net dries by the very act of sweeping. As it gets on towards mid-day, and the sun becomes hot, the beetles disappear; and my experience has been that on a hot day in the middle of summer it is useless to sweep between half-past eleven and three or four o'clock, although of course some things may be found in shady places. About four matters begin to improve, and go on getting better and better until an hour before sunset; from this time, as long as it is possible to see, a rich harvest may be reaped in a favourable locality; Carabidæ, Staphylinidæ of all sorts, Scydmanidæ, Trichopterygidæ, and species of all kinds come out in the evening in profusion. Some beetles, such as *Bryaxis helferi*, are hardly ever taken except just at dusk; but the species that are most sought after at this time are the Anisotomæ, which seem almost entirely crepuscular, and may sometimes be found in fair abundance at sundown in a spot which has not produced a single specimen during the whole preceding day. *Colons* should also be looked for at this time. I have beaten *Colon brunneum* from an aspen tree on a summer afternoon, but this was probably accidental. Dr. Power, who has perhaps taken more of this very rare genus than any other collector, says that they are to be taken at sundown by sweeping wild strawberry plants and other short herbage in the clearings of woods. I think it very probable, from two or three captures of species on the open sides of the Malvern Hills that have come under my notice, that several

members of the genus occur on barren heaths or waste places that are never touched by the sweeping-net. There is no doubt that some rare species may be found in such localities, and hence, probably, their rarity, for very few people think of sweeping the centre of a barren-looking field. I remember the late Mr. Garneys telling me of a rare species (I think one of the Mordellidæ) that he took in this way, and brought to London just as it was on the point of being erased from the British list.

Very few collectors have ever tried the twilight before sunrise; although many species might then be found, it is probable that it would not prove nearly so good a time as the twilight after sunset, as in the latter case the ground is heated, in the former it is chilled. There is, however, a very productive time during which hardly any beetle collectors think of working, and that is the night; lepidopterists know well that Carabidæ, Longicorns such as *Prionus*, *Helops cæruleus*, *Eryx atra*, and others, come freely to sugar. *Opilo mollis* owes its rarity probably to being, as a rule, a species that comes out at night, when it may be taken on elder and other trees. The Carabi are always prowling about by night, and on this account are so often found crushed in the pathways; it is rather the exception than the rule to see a large *Carabus* abroad in the daytime; actual sweeping, however, at night will soon prove how many species are abroad. It is a very good plan in many localities to sweep promiscuously in the dark with a large deep net, and then tie it up tightly, and examine its contents at leisure next day. Mr. Matthews and Mr. Crotch on one occasion took *Stenus opticus* (then very rare) in abundance by adopting this plan, although they could not find a single specimen during the daytime. One of the very few known British specimens of *Sesia allantiformis* was found by Mr. Matthews in his net one morning after sweeping in this way on the previous night, so that this may be a hint to lepidopterists as well, although they are nocturnal workers by profession already.

With regard to weather and temperature a warm day after rain is the best; a little moisture is necessary, and a warm damp day, with no sun at all, will sometimes bring out such sun-loving species as Longicorns in abundance, and everything else in proportion; dry heat is unfavourable; a south or west wind is almost indispensable; a north or east wind is fatal to success in

almost all cases. Although I have found a good many species in a sheltered spot in spring when the wind was in the east, yet, on the other hand, on a hot day in June or July, with a light east wind blowing, I have hardly been able to find a single insect. A hot sun, with a west wind after a heavy shower of rain, when everything begins to steam, will bring up all kinds of insects in profusion.

As to the kind of ground, every collector will soon find out for himself the most productive spots in his own locality, and know exactly how to work them; the great secret is not to be in too great a hurry to try fresh places. If a good beetle is found in any place (and this, as has been said before, applies to all collecting) there are probably more not far off, and a diligent and careful examination will often reveal the habits of the species, and many may be taken. As a rule, open and grassy places in woods, the sides of hedgerows, the margins of streams and ponds, open spaces and gullies close to the coast, especially strips of grass on the edges of cliffs, are the best to work; beetles do not like to be shut in where they cannot get sun and air. This applies almost more strongly to beating, for which there is nothing better than the low growth that shoots from stumps of trees in the first, second, or third year after cutting: the *Agrili* like the second year after cutting; beetles like *Apoderus coryli* the second or third year; and the *Cryptocephali* about the fourth year. Full-grown trees are said not to produce much, but this is probably because they are hard to work. The Scotch fir and the oak certainly abound in species, and I have heard of numbers of *Saperda scalaris* having been obtained from high aspens by the novel expedient of tying a stone to a cord, and flinging it over the top boughs and so shaking them. Some species are found by sweeping under particular trees, but these are often accidental, being properly attached to the tree itself; still this method is useful, as it may lead to the examination of the tree for the species.

No collector can sweep or beat satisfactorily without some knowledge, however small, of Botany. As far as beating goes it takes a very little while to discover the species that affect different trees; but with sweeping it is a much harder matter. It is impossible to beat many trees at once, although in beating a high hedgerow a little confusion may arise as to the tree or bush that

the species came from. In sweeping, however, over any extent of ground it is next to impossible to tell from what plant a particular species has been obtained, but a little knowledge of the plants to which groups are attached will often put the collector on the right scent, and enable him to take a large number of a good species.

Many groups, especially Curculionidæ, are fond of nettles. The Cruciferæ are particularly affected by certain Chrysomelidæ and also Curculionidæ, especially *Ceuthorrhynchi*, *Poophagi*, *Phytobii*, and others. The groundsel (*Senecio*) is a favourite food-plant for species of *Thyamis*; the Geraniaceæ for *Cœliodes*; the clovers and trefoils for Sitonidæ, and above all for Apionidæ; and the Verbascum for the *Cionus* (I have known several of the species taken on one plant). Several small *Ceuthorrhynchidii* (*C. Dawsoni*, *C. frontalis*, and *C. troglodytes*) live on different species of *Plantago*, while the Lemnaceæ and other water-plants must be searched for *Donaciæ*; certain Cyperaceæ for some of the *Erirrhini*, *Telmatophili*, &c.; the Alismaceæ for *Bagoi*; and species of *Carduus* for *Larinus*, *Rhinocyllus*, &c. *Lixi* and others inhabit the stems of the thistles, and *Mononychus* the seed-pods of *Iris pseudacorus*; the Longicorns may be found in abundance on Umbelliferæ in woods, and certain *Cryptocephali* and *Mordellæ* on *Hieracia*; while the Labiatæ, especially *Lamium album* and *Stachys sylvatica* must be carefully examined by all collectors who wish to get together the obscure genus *Meligethes*, although certain good species of this genus are attached to the Ranunculaceæ, especially *Caltha palustris*. It must not be supposed, however, that the species are attached to all members of a family of plants; they are very discriminating, and, as a rule, each species of beetle is attached to its particular species of plant, and not even to a particular genus.

A collector should never work quite indiscriminately, although he must always do so to a certain extent. He should always set a particular class or genus before him, and find out as much as he can about its habits, and the trees or plants to which it is attached. He should then work particularly for the species belonging to it, and will find himself well rewarded, not only by taking these, but also by often taking many more species of other genera than he would otherwise obtain by aimless general collecting.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS DAPLIDICE AND HYDRILLA PALUSTRIS AT CAMBRIDGE.—Last July Mr. Chas. C. Baker, of 72, King Street, Cambridge (and formerly Master of the King Street Schools in that town), was good enough to show me the collection of butterflies and moths formed by him some years ago in that neighbourhood. Amongst them was a fine specimen of *P. daplidice* taken by him near Newmarket on the 5th August, 1868; also three *cænosa* bred from larvæ taken by him at Wicken. An unset *Noctua* also attracted my attention as belonging to a species unknown to me. This he very kindly allowed me to take away and identify; and a comparison with the specimen in the late Mr. Allis's collection in the Museum at York showed me at once that it was a male *H. palustris*, a conclusion which Dr. Battershell Gill has since verified. Mr. Baker has been so exceedingly kind as to give me both the Bath White and the *palustris*, as well as a fine specimen of *cænosa*.—A. F. GRIFFITH; Sandridge, St. Albans, Jan. 30, 1883.

NOTES FROM WOTTON-UNDER-EDGE AND NEIGHBOURHOOD.—The season of 1882 has been generally described as an unfavourable one for the lepidopterist, and the few notes from this locality will not be very different from those sent from other parts; but as they are very short, perhaps you will be able to find a space for them, if worthy of insertion in your pages. There has been a great diminution in the number of *Argynnis paphia*; all the pupæ found in June were infested by ichneumons (R.C.L.P.) On the other hand, *A. aglaia* swarmed on the hills in August, some of the females being exceedingly rich and darkly coloured. *A. adippe* was altogether absent. *Melitæa artemis* occurred sparingly at the latter end of May. *Nemeobius lucina* was fairly represented, and I took some in very fair condition when down here in May. *Thecla rubi* swarmed in May in the hazels, and also at the flowers of the common bugle. I never saw this insect so abundant. The same may be said of *Thecla quercus*, among the oaks in August. These two butterflies were certainly exceptions to the general rule. *Lycæna alexis* was decidedly scarce; *L. corydon* fairly common, but we only obtained one specimen of *L. adonis*, and that was in August. Of moths, *Lithosia rubricollis* was common in May, among Scotch firs, flying in the daytime, this insect being new to me in this district; and among numbers of *Euchelia jacobææ*,

which was as common as usual, my nephew captured one soot-black all over, an interesting and peculiar variety; unfortunately it is not a first-class specimen. Several larvæ of *Chærocampa porcellus* were met with.—V. R. PERKINS.

LEPIDOPTERA IN CARMARTHENSHIRE.—Information having now been received from nearly all parts of the country as to the occurrence of Lepidoptera in the year 1882, a list of those observed during that year in Carmarthenshire may not be unwelcome. The list is remarkably deficient, taking it in comparison with observations made in former years. This is in a great measure owing to the very unfavourable state of the weather during the last season, which must to a great degree have acted prejudicially to the development of insect life; but it also rendered the pursuit of the insects themselves somewhat tiresome, or, to say the least of it, less exhilarating than it usually is, for bad weather and bad success do not contribute to the charms of an entomologist's pursuits. The weather, therefore, had something to do in preventing that vigilant search which is necessary if we wish to arrive at the real entomological resources of a neighbourhood. In the list which follows, the Diurni and Nocturni, though poor, show rather better than the other groups; but the Geometræ and Noctuæ were certainly nothing like properly worked. The scarcity of the Geometrina, however, may be plainly shown by the few that fell to the net during several long marches made in pursuit of them, and this shows that though not sought after with the greatest zeal or energy, their number may be safely estimated at less than half the usual average. The few larvæ, too, of any kind which fell to the beating-stick during the season show how remarkably scarce were larvæ even of the commonest species. We must hope, however, that the development of the different species is in many cases only retarded, and that a favourable spring and summer may show as many of them again on the wing in as good numbers as formerly. I now add the list:—*Pieris rapæ* and *P. napi*, common; *Anthocharis cardamines*, in great numbers; the Argynnidæ are invariably rather scarce here, but last year *Argynnis euphrosyne* was the only one seen; *Vanessa urticæ*, plentiful; *V. io*, scarce; *Arge galatea*, one only. The following were in good numbers:—*Satyrus egeria*, *S. megæra*, *S. janira*, *S. tithonus*, *Chortobius pamphilus*, and *Polyommatus phlæas*. Of

the blues *Lycæna alexis* was the only one seen, and of the Hesperiidæ not one. Among the Sphingidæ *Acherontia atropos* and *Chærocampa elpenor* were the only representatives. About forty-five species, chiefly common everywhere, were also seen. The only insects in any abundance were the larvæ of *Eupithecia virgaureata* on the flowers of ragwort (*Senecio jacobæa*), and those of *E. minutata* on the flowers of devil's-bit scabious (*Scabiosa succisa*).—OWEN S. WILSON; Carmarthen.

EARLY BREEDING OF ENDROMIS VERSICOLOR.—I was surprised to see on the morning of February 15th a fine male *E. versicolor* in my breeding-cage, which had been exposed out of doors, and therefore in no way forced. The specimen had been two years in pupa, being from Rannoch eggs received 1881.—W. H. TUGWELL; Greenwich, Feb. 17, 1883.

ACRONYCTA STRIGOSA AT MEPAL.—The area to which *Acronycta strigosa* is confined seems so limited that those interested in the distribution of this local species may like to hear that on July 14th, 1882, I captured a female specimen in the garden of Mepal Rectory. From Skertchley's 'Fenland Past and Present' we learn that *A. strigosa* has occurred at a goodly number of places close to Cambridge, but chiefly on the eastern side, as, for instance, at Fulbourne, long considered its head-quarters. It is apparently much rarer as we get further from Cambridge, and has not yet been turned up at Ely by any of the entomologists working there. It has been taken by Mr. Fryer at Chatteris, distant only four miles from Mepal, which lies eight miles west of Ely, and possesses some historical interest from its importance as a fenland centre in earlier times. From an entomological point of view it does not seem to produce any very noteworthy species, with the exception of *A. strigosa*, unless we may reckon as such *Xanthia gilvago*, which is common enough at sugar in the autumn months.—HAROLD A. HARRIS; Mepal Rectory, Ely, Jan. 17, 1883.

YPSIPETES ELUTATA.—While out on the moors near this neighbourhood searching for larvæ of *Larentia cæsiata* and *Cidaria populata* on *Vaccinium*, I got a number of larvæ feeding on the common ling, not knowing the species at the time. I brought them home and reared them separately to see what would come out. When they appeared they were the same dark

form of this species. I now take it every year feeding on the ling, and think Mr. J. Jenner Weir was quite right in naming this species as a heath-feeder, that being the common food-plant on the mountains in the North. Lower down among the woods the larger variety swarms, and feeds on the different species of sallow.—WM. REID; Bridgefoot, Pitcaple, Aberdeenshire, N.B., Feb. 6, 1883.

DESCRIPTION OF THE LARVA OF CHILO PHRAGMITELLUS.—When collecting at Wicken Fen in June, 1880, and again in May, 1882, I found the larvæ of this species were readily procured, by pulling at the tall, withered, previous year's reed-stems along the ditch sides; the stems tenanted by larvæ or pupæ broke off near the roots. Length just about an inch, and rather slender. Head considerably smaller than the second segment; it has the lobes rounded, and is, as is also the frontal plate, highly polished; the whole surface of the upper part of the body indeed is very smooth and glossy. Body cylindrical, but when crawling is strongly attenuated posteriorly. Segmental divisions well defined, and the tubercles distinct but not very prominent. The ground colour is a pale yellowish grey, some specimens having a pink tinge. Head wainscot-brown, the mandibles very dark sienna-brown. Frontal plate greyish yellow, edged all round with smoke-colour; the purplish brown alimentary canal forms the dorsal stripe; the subdorsal and spiracular stripes broader, also purplish brown; this darker colour is also more or less suffused on the dorsal area between the subdorsal lines, giving some specimens a darker appearance than others. Spiracles and tubercles intensely black. Ventral surface, legs, and prolegs uniformly of the pale ground colour of the dorsal area. It feeds in the reed stem, just below the surface of the ground, and frequently, probably usually, under water. The change to pupa also takes place inside the stem. This is large for the size of the moth, those which will produce female specimens being nearly an inch in length. It is long, cylindrical, narrow, and of nearly uniform width, tapering near and towards the anal point, and also towards the snout; it is smooth, highly polished, and all the parts well defined. When exposed it is very active, wriggling and twisting about rapidly and with the greatest ease. Ground colour of the abdominal segments deep ochreous yellow; wing-, eye-, leg-cases, abdominal divisions, and anal point, dark

brown. In some reed-stems I found, instead of the larva or pupa, batches of cocoons of a small but very pretty ichneumon, and in one instance the just-emerged ichneumons were inside the stem. They were brightly coloured, black and reddish brown. A number of these I forwarded to Dr. Capron, who informed me they were a species of *Apanteles*, new to Science (Entom. xiv., 142).—GEO. T. PORRITT; Huddersfield, Feb. 8, 1883.

TINEA PALLESCENTE.—I took a very fine specimen of this insect in my garden in the middle of last month, being the first I have seen in this neighbourhood. Before the firm with whom I am engaged removed from 101, Fenchurch Street, which was directly opposite the dock warehouses, these moths came freely to light on mild, damp evenings, during the months of October, November and December, and I secured a large series of beautiful specimens. This is no doubt an imported species, and I believe all my specimens came from the warehouses mentioned above. It appears to be gradually extending its range, and promises to become one of our commonest insects.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., Feb. 14, 1883.

HYMENOPTEROUS PARASITES OF LEPIDOPTERA.—Since the publication of the last list (Entom. xiv. 138) the following bred specimens of parasitic Hymenoptera have passed through Mr. Bridgman's or my hands. As in the former lists, the species not included in Marshall's catalogue have their names printed in small capitals. Our thanks are due to many entomologists who have favoured us with their bred parasites, from the examination of which much information has already been elicited.

Ichneumon bilineatus, Gmel., from *Notodonta dodonea* (G. Elisha).

I. xanthorius, Forst., from *Dianthæcia irregularis* (Mrs. Hutchinson, G. C. Bignell).

Exophanes occupator, Gr., from *Nonagria sparganii* (W. R. Jeffrey).

Amblyteles margineguttatus, Gr., from *Noctua brunnea* (G. C. Bignell).

A. castigator, F., from *Dianthæcia carpophaga* (Elisha).

A. panzeri, Wesm., from *Agrotis exclamationis* (W. Buckler, Bignell).

Trogus lutorius, F., from *Sphinx ligustri* (G. T. Baker; G. H. Raynor).

T. (Automalus) alboguttatus, Gr., from *Orgyia pudibunda* (Bignell).

Eurylabus dirus, Wesm., from *Eriogaster lanestris* (R. M. Sotheby).

Platylabus orbitalis, Gr., from *Phibalapteryx tersata* (V. R. Perkins).

P. dimidiatus, Gr., from *Melanippe fluctuata* (Sotheby).

Ischnus nigricollis, Wesm., from *Pterophorus (Aciptilia) galactodactylus* (G. T. Porritt).

- Cryptus tricolor*, Gr., from *Simyra venosa* (W. H. Harwood, Bignell).
C. incubitor, Stroem. (? *fumipennis*, Gr.), from *Saturnia carpini* (R. Meldola; Elisha; E. A. F.).
Mesostenus obnoxius, Gr., from *Zygæna filipendulæ* (M. S. Jenkyns).
Hemiteles furcatus, Tasch., from *Apanteles* cocoons ex *Zygæna filipendulæ*; *Dianthæcia cucubali* (Bignell); *Gracilaria phasianipennella* (J. H. Threlfall; J. E. Fletcher).
H. fulvipes, Gr., from various *Microgasterid* cocoons by several correspondents.
H. areator, Panz., male, from *Macrocentrus thoracicus* ex *Phycis betulella* H. Bartlett, E. A. F.); *Talæporia pseudobombycella* (J. T. Carrington); *Gelechia vulgella* (Elisha).
H. melanarius, Gr., from *Argynnis paphia* (Bignell).
Hemimachus rufocinctus, Gr., male and female, from *Zygæna filipendulæ* W. H. Grigg, Bignell); *Coleophora cæspititiella* (Fletcher).
Pezomachus insidiosus, Först., from *Coleophora viminetella* (Fletcher).
P. analis, Först., male and female, from *Zygæna filipendulæ* (W. H. Grigg, Bignell).
Henicospilus ramidulus, L., from *Trachea piniperda* (F. Norgate).
Ophion luteum, L., from *Miselia oxyacanthæ* (Bignell).
ANOMALON PERSPICUUM, Wesm., from *Cleora lichenaria* (E. Atmore).
A. clandestinum, Gr., from *Eupithecia castigata*; *Cerostoma costella* (Bignell); *Eupithecia absynthiata* (Raynor).
Agrypon tenuicorne, Gr., from *Selenia lunaria* (Elisha).
A. canaliculatum, Ratz., from *Steganoptycha rufimitrana* (Lord Walsingham).
A. SEPTENTRIONALE, Holmgr., from ? *Pæcilocampa populi* (Raynor).
Trichomma enecator, Rossi, from *Tortrix* larva on *Myrica gale* (Walsingham).
Paniscus cephalotes, Holmgr., from *Dicranura vinula* (E. W. Andrews; Sotheby); *D. bifida* (Baker).
P. virgatus, Fourc., from *Odontopera bidentata*; *Cosmia trapezina*; *Halias prasinana* (Bignell).
P. testaceus, Gr., from *Eupithecia castigata* (Bignell).
P. TARSATUS, Brischke, from *Eupithecia castigata*; *E. absynthiata*; *E. virgaureata* (Bignell).
Campoplex mixtus, Gr., from *Biston hirtaria*; *Amphydasis prodromaria*; *Pygæra bucephala* (Bignell); *Fidonia piniaria* (E. A. F., cocoon from G. H. Raynor).
C. falcator, Zett., from *Notodonta ziczac* (Bignell).
C. oxyacanthæ, Boie, from *Himera pennaria* (Bignell).
C. pugillator, L., from *Amphydasis betularia*; *Tæniocampa populeti* (Bignell).
C. pugillator, L., var. ? from *Thecla betulæ* (T. Eedle); *Cymatophora ridens* (Bignell).

- C. ebeninus*, Gr., from *Orgyia fascelina* (Harwood, Bignell).
C. ? n.s., from *Tortrix forsterana* (Elisha).
Sagaritis declinator, Gr., from *Limacodes asellus* (Bignell).
S. n.s., from *Tæniocampa stabilis* (Bignell).
Limneria bicingulata, Gr., from *Hybernia progemmaria* (Bignell).
 L. BRISCHKEI, Brdg., from *Noctua triangulum* (Bignell).
 L. CARBONARIA, Brischke, from *Amphidasis prodromaria* (Bignell);
Boarmia roboraria (Bignell, larva from J. Hellins).
L. crassiuscula, Gr., from *Dicranura vinula* (Bignell).
 L. CURSITANS, Holmgr., from *Vanessa atalanta* (H. M. Golding-Bird—Mrs. Norgate, Bignell).
L. ensator, Gr., from *Yponomeuta plumbella*; *Coleophora onosmella* (Elisha).
L. erucator, Holmgr., from *Hybernia progemmaria* (Bignell); *Spilonota neglectana*; *Gelechia obsoletella* (Elisha).
L. faunus, Gr., from *Plutella porrectella* (Elisha).
L. femoralis, Gr., from *Coleophora conspicuella* (Elisha).
L. flexicauda, Holmgr., from *Peronea hastiana* (Perkins).
L. geniculata, Gr., from *Phycis betulella* (Bartlett, E. A. F.).
 L. INTERRUPTA, Holmgr., from *Arctia fuliginosa* (Raynor); *Tortrix rosana*; *Dictyopteryx bergmanniana*; *Laverna fulvescens*; *Gelechia hippophælla* (Elisha).
 L. KRIECHBAUMERI, Brdg., from *Tæniocampa stabilis* (Bignell).
 L. LUGUBRINA, Holmgr., from *Gelechia brizella* (Sang).
L. mæsta, Gr., from *Hybernia defoliaria* (Bignell).
L. multicincta, Gr., from *Alucitina polydactyla* (E. A. F.).
L. mutabilis, Holmgr., from *Tortrix rosana*; *Ephippiphora fœneana*; *Grapholitha paykulliana* (Elisha); *Tortrix* larva on *Lithospermum* (Raynor).
L. nana, Gr., from *Laverna fulvescens* (Fletcher).
 L. RUFA, Brdg., from *Bombyx quercus* (Bignell).
L. ruficincta, Gr., from *Dianthæcia cucubali*; *Hecatera serena*; *Anarta myrtilli* (Bignell); *Ellopiæ fasciaria* (Mrs. Hutchinson, Bignell); *Pterophorus (Mimæoptilus) plagiodactylus* (C. G. Barrett).
L. rufipes, Gr., from *Gelechia hippophælla*; *Laverna fulvescens* (Elisha).
L. tibialis, Gr., from *Coleophora albitarsella* (Elisha).
L. unicincta, Gr., from *Vanessa urticæ*; *Orgyia pudibunda*; *Limacodes asellus*; *Odontopera bidentata*; *Eupithecia rectangulata* (Bignell); *Acronycta psi* (Fletcher); *Pterophorus (Aciptilia) galactodactylus* (Porritt).
 L. VESTIGIALIS, Ratz., from *Depressaria assimilella* (Atmore).
L. viennensis, Gr., ? from *Gracilaria stigmatella* (Threlfall).
 L. VULGARIS, Tschek., from *Gonepteryx rhamni* (Bignell).
L. n. s., ? from *Cucullia asteris* (Jeffrey).

- L. n. s.*, ? from *Eupithecia rectangularata* (Bignell).
Cremastus albipennis, Zett., ? from *Coccyx strobilana* (Fletcher).
Mesochorus confusus, Holmgr., var. ?, from *Xylopoda fabriciana* (Bignell).
M. pictilis, Holmgr., from *Iodis lactearia* (Bignell).
M. anomalus, Holmgr., from *Nola cucullatella* (A. S. Olliff); *Apanteles difficilis* on *Euchelia jacobæ* (Bignell).
M. olerum, Curt., from *Coleophora* sp.?, on *Galium verum* (Raynor).
M. GRACILENTUS, Brischke, from *Limneria vulgaris* ex *Gonepteryx rhamni* (Jenkyns).
M. FORMOSUS, Brdg., from Braconid cocoons (Porritt); *Macrocentrus collaris* ex *Noctua triangulum*; *Apanteles* cocoons ex *Xylina rhizolitha* (Bignell).
M. FUSCICORNIS, Brischke, from *Apanteles* cocoons ex *Abraxas grossulariata*; *Apanteles nothus* ex *Melanippe galiata* (Bignell).
M. GIBBULUS, Holmgr., from *Limneria lugubrina* ex *Hypera variabilis* (E. A. Butler).
Exetastes illusor, Gr., from *Arctia caja*? (E. A. F.).
Exochus mansuetor, Gr., from Tortrix pupa on sallow (E. A. F.).
E. congener, Holmgr., from *Nola cicatricalis*, Tr. (Baker); pupa from Hungary.
E. tibialis, Holmgr., var., from *Stigmonota rufimitrana* (Walsingham).
Chorinaeus talpa, Hal., from *Gracilaria semifascia* (Elisha).
Metopius micratorius, F., from *Bombyx callunæ* (Mrs. Norgate).
Pimpla instigator, F., from *Zygana filipendulæ* (Olliff); *Liparis chrysorrhæa* (J. J. Weir); *L. auriflua*; *Arctia caja*; *Pygæra bucephala*; *Gonoptera libatrix* (E. A. F.); *Lithosia quadra* (Eedle); *Ennomos tiliaria* (Harwood, Bignell).
P. flavonotata, Holmgr., from *Vanessa c-album*; *Ennomos tiliaria* (Bignell).
P. brevicornis, Gr., from *Dianthæcia cucubali* (Bignell); *Tortrix forsterana*; *Sericoris euphorbiana* (Elisha).
P. nueum, Ratz., from *Tortrix sorbiana*; *Ephippiphora fœneana*; *Eupæcilia ciliana* (Elisha); *Lithocolletis* on birch (Fletcher).
Glypta hæsitator, Gr., from *Tortrix* on *Myrica gale* (Walsingham).
G. scalaris, Gr., from *Endopisa nigricana* (Fletcher).
G. bifoveolata, Gr., from *Ephippiphora fœneana* (Elisha).
Lissonota decimator, Gr., from *Gortyna flavago* (Norgate).
L. segmentator, F., male?, from *Scardia cloacella* (Fletcher).
L. FLETCHERI, Brdg., from *Gelechia lentiginosella* (Fletcher).
Phytodietus segmentator, Gr., from *Tortrix viridana* (Bignell); *Phoxopteryx mitterbacheriana* (Fletcher).
P. scabriculus, Gr., from *Endopisa leplastriana* (Elisha); *Tortrix* on *Myrica gale* (Walsingham); galls of *Andricus terminalis* (Fletcher).
Bracon satanas, Wesm., from *Eupæcilia ciliana* (Elisha).

- B. sp.?*, from *Alucitina polydactyla* (E. A. F.).
Clinocentrus exsertor, Ns., from *Spilonota neglectana* (Elisha).
Rhogas bicolor, Spin., var., from *Zygæna filipendulæ* (Jenkyns).
R. circumscriptus, Ns., from ? *Odonestis potatoria* (Bignell; Butler; E. A. F.; Sotheby; A. H. Swinton); *Melanippe galiata* (Bignell); *Tæniocampa stabilis* (Bignell).
Colastes braconius, Hal., from *Tischeria dodonæa* (Fletcher); *Phytomyza nigricans* in *Symphoricarpos* leaf (P. Inehbald).
Ascogaster rufipes, Latr., from *Endopisa leplastriana*; *Coleophora gryphipennella* (Elisha).
A. consobrinus, Curt., from *Chelonia caja* (E. A. F.); *Gelechia vulgella* (Elisha).
Apanteles albipennis, Ns., from *Eupæcilia ciliana*; *Gelechia tricolorella*; *Gracillaria semifascia* (Elisha).
A. glomeratus, L., from *Pieris brassicæ*; *P. rapæ* (Bignell).
A. juniperatæ, Bé., from *Bombyx rubi* (Meldola); *Odontopera bidentata*; *Crocallis elinguaris*; *Amphidasis betularia* (Bignell); *Melanippe galiata* (Sotheby).
A. difficilis, Ns., from *Phigalia pilosaria* (Sotheby, Butler); *Eupithecia valerianata* (*vininata*) (Raynor); *Pterophorus* (*Mimæsoptilus*) *plagiodyctylus* (Carrington).
A. ruficrus, Hal., from *Plusia gamma* (Fletcher).
A. rubripes, Hal., from *Geometra papilionaria* (Raynor); *Iodis lactearia* (Bignell).
A. BREVICORNIS, Wesm. (? = *placidus*, Hal.), from *Tethea retusa* (Bignell).
A. SPURIUS, Wesm., from *Euchelia jacobææ* (Sotheby).
A. PUNCTIGER, Wesm., from *Eupæcilia ciliana*; *Gracillaria semifascia* (Elisha).
A. n.?s. (near *falcatus*, Ns.), from *Pterophorus* (*Leioptilus*) *microdactylus* (Elisha).
Microplitis dorsalis, Spin., from *Cerastis spadicea* (Bignell).
Orgilus obscurator, Ns., from *Coleophora alcyonipennella* (Elisha).
Therophilus cingulipes, Ns., from *Parasia carlinella* (Elisha); *Coleophora troglodytella* (Fletcher).
T. rufipes, Ns., from *Coleophora gryphipennella* (Elisha).
Perilitus cinctellus, Ns., from *Xylophasia scolopacina* (Eedle).
P. unicolor, Wesm., from *Tæniocampa cruda* (Sotheby, Butler).
HOMOLOBUS DISCOLOR, Wesm., from *Cabera pusaria* (Bignell).
Macrocentrus linearis, Ns., from *Platypteryx falcata* (Bignell); *Ebulea crocealis*; *Cerostoma xylostella* (Elisha).
M. linearis, var. *pallipes*, Ns., from *Fnnychia octomaculalis* (Jeffrey); *Gelechia mouffetella* (Elisha).
M. thoracicus, Ns., from *Phycis betulella* (E. A. F., cocoons from H. Bartlett).

- M. collaris*, Spin., from *Noctua triangulum* (Bignell).
Eulophus ramicornis, Geof., from *Clostera curtula* (Raynor).
Eulophus sp.? from *Tæniocampa stabilis* (Bignell).
E. sp.? from *Dianthæcia cucubali* (Bignell).
Pteromalus puparum, Swed., from *Pieris rapæ*; *Vanessa c-album* (Bignell);
Vanessa urticæ (Sotheby).
Copidosoma chalconotum, Dalm., from *Depressaria heracliana* (Hellins, Bignell).
 —EDWARD A. FITCH; Maldon, Essex, February, 1883.

NOTE ON *LIMNERIA RUFÆ*, Brdg., *L. BRISCHKEI*, Brdg., AND *RHOOGAS RETICULATOR*, Nees. — The season having arrived for obtaining *L. rufa* and the two following Ichneumons, a few remarks on their economy may be interesting to some of the readers of 'The Entomologist.' To obtain *Limneria rufa*, which is a new species bred by the writer last year, it is necessary to obtain the larva of *Bombyx quercus* this month (March); for this reason, the ichneumon larva leaves its victim before it moults for the fourth time. When it does leave it, it forms an oval, black, rough cocoon under the unfortunate caterpillar on the inside of which it had been feeding. The writer obtained the first infested larva when at Torquay on the 14th March, and bred the parasite on the 5th April, 1882. *Limneria brischkei*, Brdg., is also a new species, bred last year. The parasitic larva came out of a small larva (about one-third grown) of *Noctua triangulum*, which was obtained during the first week in March at Penzance. After leaving its victim it formed a long oval, dirty white, rough cocoon, without zones; the empty skin of the *Noctua* larva remained attached to its side; the imago appeared on the 5th April. *Rhogas reticulator*, Nees, infests the larva of *Odonestis potatoria* before the fourth moult, and emerges in its imago state from its victim. The infested larva remains on its food-plant, and has the appearance of preparing to moult, but it gradually shrinks and appears to dry up; the imago ultimately making its appearance through the back of the wretched caterpillar.—G. C. BIGNELL; Stonehouse, Plymouth, February 20, 1883.

PARASITE ON THE LARVA OF *ACRONYCTA PSI*.—On August 24th, 1882, whilst walking under some lime trees, I picked up the larva of an *Acronycta psi*. On examining it the next day I found two chocolate-brown coloured eggs on its left side, between its head and the horn, which this caterpillar has on its back; both

eggs were visible to the naked eye, but one was larger than the other. On the 26th the larger egg had enlarged, and a portion of it was white. 28th. Still more enlarged. 29th. More enlarged; it now looked like an elongated bladder with a kind of footstalk, which was firmly attached to the caterpillar under the bladder-like looking object; a portion of the dark egg was still to be seen between it and the beginning of the footstalk; the bladder-like object or grub was in segments, was transparent white, with white tree-like opaque markings, and there was something dark forming inside it. 30th. Still larger. 31st. Larger; it was by this time a quarter of an inch long, and formed an arch over the caterpillar's neck. For several days past the poor caterpillar had tried in vain to rub off this unwelcome guest, but all its efforts were in vain. September 1st. Larger; the caterpillar had by this time become very torpid, and had lost its beautiful colouring. 2nd. Larger, and nearly opaque white; and by three o'clock, p.m., it had come off, and was half an inch long; the grub had no legs, but used the posterior part of its body to move itself about with, but it did not do much more than tumble about incessantly; by this time the caterpillar was dead. 3rd. The released grub was still larger, but not so lively; and on the 6th had changed from cream-colour to bright yellow. October 12th it began to darken, and on the succeeding day was chocolate-brown, had shrivelled up to half its former size, and appeared dead. It had evidently died in the act of spinning its cocoon, or in changing into pupation. On two occasions I submitted the larva, with its unwelcome guest on it, to the inspection of the best practical entomologist we have in this town, and he said he had never seen anything of the kind before on a caterpillar, although he had had thousands of lepidopterous larvæ under his care. I enclose the smaller egg; the piece of skin which came off the *Acronycta* caterpillar, and which had, when on, the appearance of a footstalk; also the grub in its changing state, when it died; and shall be obliged for any information on the subject.—CLARA KINGSFORD; Barton House, Canterbury, January 6, 1883.

[The objects sent were quite unrecognisable when received by me. There can be little doubt, however, but that the external parasite alluded to is *Paniscus cephalotes*, Holmgren,—one of the Ophionidæ (ichneumons), whose interesting economy has been so lately referred to in these pages by Mr. E. W. Andrews (Entom.

xv. 163). Herr Brischke has bred this species from *Acronycta psi*, *A. tridens*, and *A. megacephala*, amongst others. The curious pedunculated egg and economy of the young *Paniscus* larva is alluded to in Westwood's "Introduction" (vol. ii., pp. 145, 146), and Hartig's figures copied (fig. 76, 9-14); see also Brischke and Adler in the 'Entomologische Nachrichten' (v. 221, 265).—E. A. F.]

NOTE ON NYCTEMERA ANNULATA (CORRECTION).—I find that the fly mentioned in my last note on *Nyctemera annulata* (Entom. xvi. 39) is not *Chlorogaster ruficeps*, but a new species which has been recently described in the 'Transactions of the New Zealand Institute' by me under the provisional name of *Nemoræa nyctemerianus*. I regret that this error should have taken place.—GEO. VERNON HUDSON; Karori, Wellington.

THE YORKSHIRE LIST OF LEPIDOPTERA. — Entomologists generally, and particularly those of the North of England, will be pleased to know that the Catalogue of Yorkshire Lepidoptera, on which Mr. Geo. T. Porritt, F.L.S., of Huddersfield, has for the last few years been engaged, is now complete. The manuscript has been placed in the printer's hands by the Secretaries of the Yorkshire Naturalists' Union, in whose 'Transactions' the list will be published. Mr. Porritt has received the assistance of the leading lepidopterists of Yorkshire. In the list are included about two-thirds of the species occurring in the British Isles.—W. D. ROEBUCK; Sunny Bank, Leeds,

OBITUARY.

BENJAMIN COOKE, who was for several years President of the Northern Entomological Society, and later Vice-President of the Lancashire and Cheshire Entomological Society, died suddenly at his residence in Southport on Sunday, the 4th of February, 1883, at the age of 66 years. Benjamin Cooke was unquestionably the best all-round entomologist Lancashire has produced for many years; but being so timid by nature and so retiring in his habits he was little known beyond his immediate circle of friends. His extreme caution and fear of making a mistake, added to the desire to be quite sure of the completeness of his observations,

led him to defer publishing his knowledge from year to year until now, unfortunately, his great experience and ripe knowledge has passed away with him ; thus his assiduous labours have borne but little fruit to be enjoyed by coming generations of students in his favourite subjects. It was, however, in the field that he was the most enjoyable companion, his never tiring recital of his varied entomological observations rendering lively many a blank collecting day.

Probably the work by which he was best known was a paper read at a meeting of the Northern Entomological Society, December 26th, 1857, upon the classification of insects, which at the time caused some sensation, and which may be found printed in 'The Zoologist,' vol. xvi., p. 5951 ; and it is only three months ago since he read another paper on the same subject before the Entomological Society of Lancashire and Cheshire. In this latter paper he acknowledges certain modifications, but in principle he still adhered to his system published a quarter of a century ago. The last sentence of his last paper is so characteristic of the man that we give it, verbatim, for the benefit of our readers :—"I have carried out the details in the arrangement of my own collection chiefly in the orders Hymenoptera, Diptera, and Hemiptera, but these details will require a thorough revision, and this cannot be done properly without assistance." Latterly he had published in the Proceedings of the same Society a Catalogue of the Hymenoptera and Diptera of Lancashire and Cheshire.

The first of the numerous additions to the British fauna made by the late Mr. Cooke was *Nyssia zonaria*, now upwards of forty years ago.

Benjamin Cooke, brother of our correspondent Mr. Nicholas Cooke, was son of the late Isaac Cooke, founder of one of the large and well-known firms of cotton brokers in Liverpool, the former being born 16th September, 1816.

I am indebted for the material of this obituary notice to my friends Messrs. S. J. Capper and C. S. Gregson, of Liverpool.—
[J. T. C.]



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CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI*.

BY RICHARD SOUTH.

(Continued from p. 29.)

OXYPTILUS, Zell.

teucarii, Greening.

(PLATE II., FIG. 1.)

IMAGO.—Expanse, 9–10 lines. Fore wing dark brown, a few scattered whitish scales along the costa; midway between digital juncture and base of wing is an indistinct blackish spot; two slender white bands run through both digits, but these are only distinctly formed and conspicuous on the outer digit; the costa is margined with white from the posterior edge of second band to the tip of digit. Fringes brown; the apical fringes of outer digit are variegated with black and white; at the tip and angle of inner digit are small tufts of black scales, and between these tufts a nearly round patch of pure white; the fringes on the middle of inner margin of this digit are also white, with three small equidistant patches of black scales. Tip of outer digit acute, that of the inner subacute. Hind wing, shafts of feathers dark brown, fringes grey-brown; third feather shorter, with a large patch of black and dark brown cilia towards the tip; this is followed by a few whitish cilia, and at the extreme tip is a small round black spot; there are also some whitish scales in the fringes between the brown patch and base of feather. Head and thorax colour of fore wing; abdominal juncture whitish. Abdomen and legs dark brown, variegated with white. July.

LARVA.—Length, 6 lines, attenuated posteriorly. Head smaller than 2nd segment, yellowish green; the crown and sides mottled with dark violet-brown, and the mandibles pale reddish brown. Ground colour green, or yellowish with green tinge; a slender faint pink dorsal line, and broader paler rosy subdorsal line. Tubercles, two dorsal rows of brownish

warts (two on each segment), each emitting a star-like ray of short white bristles, and one moderately long hair also white, but having its basal half chequered with brownish; subdorsal and spiracular rows similar to the dorsal series, but rather smaller. Spiracles enclosed in a dark violet-brown ring. Prolegs and anal claspers yellowish green, mottled with dark violet-brown. Food, wood-sage (*Teucrium scorodonia*). May and June.

PUPA.—Dull green, head and wing-cases paler; there are two dorsal rows of warts with chequered hairs, as in the larval stage. On the under side of a withered leaf, clod, or stone, attached by the anal segment. June.

Plate II., fig. 1, *Oxyptilus teucrii*; 1 a, larva; 1 b, ditto, enlarged; 1 c, pupa, enlarged; 1 d, food-plant, wood-sage or wild germander (*Teucrium scorodonia*).

This is a local species, but where met with is generally to be obtained in some numbers in the perfect state. The insect does not take long flights. Towards the end of last July I netted a large number in a fir plantation as they were darting about among a large patch of *Teucrium* in the sunshine. As the majority were considerably wasted, I was obliged to adopt the expedient of boxing all I saw, until each of my available boxes contained *Teucrii*, and then sit down and examine the condition of my captures, releasing all those not up to cabinet standard. Had the worn specimens been set at liberty as captured I should possibly have retaken them several times, so restricted was the area of their flight.

The larva gnaws a hole in the upper portion of a main shoot (*vide* plate, fig. 1 d), causing the top to droop. It may be found by carefully searching these drooping plants, or others, in the immediate vicinity.

Mr. Carrington and I found a few larvæ last June feeding on stunted plants of wood-sage, growing on a dry embankment in Tilgate Forest; but as I had the misfortune to lose the tin in which they were placed, Mr. Howard Vaughan was kind enough to send me a supply, from which the drawing and description were taken.

ALUCITA, Zell.

hexadactyla, Linn.

polydactyla, Hb.

(PLATE II., FIG. 2.)

IMAGO.—Expanse, 6–7 lines. Fore wing divided into six distinct plumes or digits; one or two of the divisions extend nearly to the base of

the wing; the shafts are pale ochreous-brown, or bone-colour; along the costa are six blackish quadrate spots; the fourth costal spot is the commencement of a blackish band, which extends across all the digits to the inner margin; a similar band runs from the sixth costal spot. Fringes pale ochreous-brown. Hind wing divided nearly to its base into six plumes, shafts and fringes pale ochreous-brown, variegated with blackish. July to April.

LARVA.—Length, 4 lines; somewhat leech-like, both extremities pointed; anterior segments retractile. Head smaller than 2nd segment, pale pinkish brown, spotted with darker brown; mandibles dark brown. Ground colour reddish pink, or salmon-colour, becoming paler when nearly full-fed, and finally, just before pupation, yellowish white. No warts; but there are a few short bristles scattered over the body. Food, honeysuckle (*Lonicera periclymenum*); feeds in the flowers in June.

Plate II., fig. 2, *Alucita hexadactyla*; 2 a, larva; 2 b, ditto, enlarged; 2 c, pupa, enlarged; 2 d, food-plant, honeysuckle (*Lonicera periclymenum*).

I take this opportunity of thanking Mr. Fitch for kindly sending me the larva of this species to describe. The imago is of frequent occurrence wherever there is honeysuckle, and hibernated specimens are often to be observed in outhouses in the country where that plant is near. If larvæ are desired, the flowers should be shaken over a sheet of paper, when the larvæ will, if present, be shaken from their retreat. Honeysuckle growing round the hollow stem of a tree, or over a portico, is a favourite nursery of *Alucita hexadactyla* larva.

MIMÆSEOPTILUS, Wallgr.

phæodactylus, Hb.

lunædactylus, Haw.

(PLATE II., FIG. 3.)

IMAGO.—Expanse, 9–10 lines. Fore wing brown, rather glossy, darker along the costa from the middle to the tip of outer digit; a pale curved blotch extends from costa to inner margin, the inner edge of which touches the digital juncture. Fringes glossy brown, darker round the anterior edge of inner digit. Tip of outer digit subacute, that of inner obtuse. Hind wing glossy brown, fringes slightly darker. Head, thorax and body brown; abdominal junction paler. Legs shining brown. July and August.

LARVA.—Length, 7 lines; moderately stout, tapering towards anal extremity. Head smaller than 2nd segment, whitish, tinged with green;

crown, sides and spot on each cheek shining black; mandibles blackish brown. Ground colour green, segmental divisions paler, dorsal line bluish green. Tubercles, four dorsal rows (four on each segment) black, each with a moderately long grey hair, and tuft of shorter whitish bristles; the inner rows of warts are situate towards the anterior, and those forming the outer rows towards the posterior edges of segments; subdorsal, a black wart on each segment, with a moderately long grey hair, and tuft of short white bristles; spiracular, two small black contiguous warts on each segment, emitting whitish hairs. Prolegs and claspers semitransparent, dotted with grey. Food, rest-harrow (*Ononis*); feeds on the terminal leaves. June.

PUPA.—Very like the larva; attached by the tail to the surface of a leaf of food-plant, generally on one of the terminal leaves. June and July.

Plate II., fig. 3, *Mimæseoptilus phæodactylus*; 3 a, larva; 3 b, ditto, enlarged; 3 c, pupa, enlarged; 3 d, food-plant (*Ononis arvensis*).

I have not met with this insect in any stage off the chalk. In North Devonshire, where *Ononis* grows in many places most luxuriantly, I did not see *M. phæodactylus*. I have also frequently examined patches of *Ononis spinosa* in various localities in Middlesex, but never observed the insect under consideration. Searching for the larva of this species is not easy work. The only way I could succeed in finding it was by kneeling down, and so bringing the eyes as close as possible to the plant. I may mention here that many leaf-feeding "plume" larvæ are in coloration and ornamentation exceedingly like the leaves on which they are found feeding or at rest. The larva of *M. phæodactylus* is especially difficult to see on this account, and until the eye becomes, as it were, trained to the task, it will fail to readily detect the object of its quest. It may be that my vision is not of the keenest, but I have certainly searched for and found many other "plume" larvæ with greater facility. The foregoing remarks apply only to searching, for where *Ononis* is in a situation favourable to beating, larvæ may be obtained without any of the unpleasant fatigue associated with searching. One season, at Ventnor, I got quite a hundred larvæ of *M. phæodactylus* by beating a long strip of the food-plant growing on an overhanging bank by a road-side.

Mr. Farn kindly told me of a locality in Kent where he had observed *Mimæseoptilus phæodactylus* flying; so as I wanted larvæ for figuring I went down there last June, in company with Mr.

Carrington, and found enough for my purpose ; but as the plant did not, from the nature of the surroundings, admit of either sweeping or beating, I had recourse to searching.

12, Abbey Gardens, St. John's Wood, London, N.W.

(To be continued.)

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By REV. W. W. FOWLER, M.A., F.L.S.

NO. XIII.—MOORS AND MOUNTAINS.—PARASITIC BEETLES.

COLLECTING on mountains and moorland is mostly confined to stone-turning and examining moss ; a great number of species are found in these localities that do not occur elsewhere. Some of the mountain beetles are evidently varying forms of common species, as, for example, *Calathus nubigena* of *C. melanocephalus*, *Pterostichus æthiops* of *P. madidus*, and perhaps, though many might dispute this, *Leistus montanus* of *L. spinibarbis*. There are, however, many distinct forms that will occur to everyone, as *Carabus glabratus*, *Calathus micropterus*, *Elaphrus Lapponicus*, and others ; good species of *Oxypoda* and *Homalota* and other *Staphylinidæ* may be found in moss on the summits of hills and mountains. Mr. Champion took several good species in this way on the top of Snowdon. I once took *Philonthus lucens* under a stone on the summit of the Worcestershire Beacon, the highest of the Malvern Hills, and the only specimen of *Eudectus Whitei* known was taken by Dr. Sharp on the summit of Ben-a-bhuird, Braemar. The herbage in hollows on the sides of mountains will produce a good many species, and while mentioning this we must not forget to notice the beautiful *Chrysomela cerealis*, which may be found in numbers when the sun is shining on the wild thyme growing on the slopes of the higher parts of Snowdon.

Small tarns and pools on mountains should always be examined for water beetles—*Agabus solieri*, *A. arcticus*, *A. congener*, *Dytiscus Lapponicus*, &c.

Although the Scotch moors and mountains are usually considered to produce better species than the English, yet English moorland is by no means to be despised. Mr. Blatch, by his captures on Cannock Chase, in the heart of the Midlands, has

proved that this is the case. Among his other captures *Amara patricia*, *Cymindis vaporariorum*, *Miscodera arctica* (in abundance), *Oxytelus fulvipes*, *Gymnusa variegata*, and *Cryptocephalus punctiger*, *C. coryli*, and *C. fulcratus* are noticeable; the most curious discovery in this locality was the maritime *Nebria livida*, first found on Cannock Chase by Mr. Harris.

Scotch collecting, however, is always looked forward to by both coleopterists and lepidopterists as sure to reward them with an abundance of good species, and they are not far wrong as a general rule; there are numbers of species that are pre-eminently Scotch. Among these *Zeugophora Turneri*, *Zilora ferruginea*, *Harpalus 4-punctatus*, *Amara Quenseli*, *Dendrophagus crenatus*, *Athous undulatus*, *Strangalia aurulenta* and several other of the best of the Longicorns, will at once occur to every collector; the rare *Cryptocephalus 10-punctatus* was only found at Rannoch until Mr. Harris found it in company with *Magdalinus carbonarius* and other good beetles at Chartley Moss, another locality in the heart of the Midlands which is quite as productive as Cannock Chase, and which seems quite peculiar both as regards its fauna and its flora.

We have not, however, time to discuss separate localities; these papers have already extended themselves to a greater length than was at first intended, and it is time that they were brought to a conclusion.

There is, however, one point that requires special mention, and that is the subject of parasitic beetles. Some beetles, as *Sitaris muralis* and *Melœ*, are parasitic on bees, others, as *Metœcus paradoxus*, on wasps; the transformations of some of these insects are most wonderful, and well worthy of the attention of every student of Entomology. *Bathyscia wollastoni*, *Cryptophagus setulosus*, and the larvæ of *Antherophagus pallens* have been found in or about the nests of different species of bees. *Leptinus testaceus* has been taken in numbers at the mouth of a humble bee's nest, and *Cryptophagus populi* in or about the nests of *Colletes Daviesiana*; some of these last-mentioned cases seem to be instances of partial parasitism, the bees tolerating the intruders probably because they act as scavengers. The very rare *Velleius dilatatus* has been taken in wasps' nests, but it was in all probability not an inhabitant, but a plundering intruder. This scarce beetle seems to be attached to the burrows of *Cossus*

ligniperda; these burrows usually contain a goodly number of parasites, if they can be strictly so called, attracted apparently by the scent and high flavour of the *Cossus* larva; among them may be mentioned *Euryusa laticollis*, *Cryptarcha strigata* and *imperialis*, *Epuraea decem-guttata*, and two or three species of *Homalota*.

Some beetles, as has before been said, are parasitic upon others, as *Colydium elongatum* and *Oxylæmus cylindricus* on *Platypus cylindrus*, and *Teretrius picipes* on *Ptilinus pectinicornis*; this sort of parasitism probably occurs in more cases than we know of, and is worthy of more attention from coleopterists than it generally receives.

Of all forms of parasitic beetles, however, those that inhabit ants' nests are the most interesting; the true ant's-nest beetles all belong to the Clavicorn group, and are very likely the scavengers of the nest; some of them probably give forth odours or secretions that please the ants, like the Aphides; it has been suggested that some species, like *Batrissus venustus*, are kept by the ants as pets, but this seems hardly likely; whatever their use may be the ants take the greatest care of them, and, if the nest is disturbed, may often be seen carrying beetles much larger than themselves into places of security; they do not, however, apparently always act with the gratitude one might expect from them, as a *Myrmedonia* has been known to devour ants with which it has been shut up; it is, however, quite possible that the beetle was put in with strangers, or that its altered circumstances induced it to behave in so barbarous a fashion.

The ant's-nest beetles were first really brought under the notice of British collectors by the excellent paper of Mr. E. W. Janson in the 'Entomologist's Annual' for 1857, and full directions are there given for working them.

Around the larger ants' nests (such as those of *Formica rufa*) stones and logs of wood should be carefully laid, and from time to time these should be taken off and closely examined; many good species will be found attached to them. A great number of ants make their nests under stones, and raise no heap, or none worth mentioning: when these stones are lifted they should be put in a cloth or in a bag and left, while the collector at once without delay examines the runs, for if he stops to examine the stone first, the ants will have carried all the beetles out of sight; if this plan be adopted with the flints in the chalky districts near

Mickleham the collector will probably be rewarded by finding *Claviger foveolatus* in the nests of *Formica flava*. *Hetærius sesquicornis* may be taken in the same way, in the neighbourhood of London, in nests of *Formica fusca*; it has also occurred with *F. flava* and *F. sanguinea*. Certain ants, as *Formica fuliginosa*, frequent hollow trees, especially oaks; the moist frass at the entrance should be thrown on a piece of white paper and carefully examined; the bark also near the entrance may produce *Amphotis marginata*, and the crevices of the tree near the nest several other species.

Mr. Janson, in his paper, gives a list of thirty-six species that are attached to ants' nests in this country; of these beetles some few are attached to two species of ants, but we may say roughly that five belong to *Formica flava*, eight to *F. fuliginosa*, six to *F. fusca*, eighteen to *F. rufa*, and four to *Myrmica rubra*. The genera represented are *Trichonyx*, *Claviger*, *Myrmedonia* (nine species), *Homalota* (the little section consisting of *H. flavipes*, *H. confusa*, and *H. anceps*), *Oxyopoda*, *Aleochara*, *Thiasophila*, *Homœusa*, *Dinarda*, *Lomechusa*, *Atemeles*, *Leptacinus*, *Staphylinus*, *Quedius*, *Hetærius*, *Dendrophilus*, *Saprinus* (*Myrmetes*), *Amphotis*, and *Monotoma*, and larvæ of *Cetonia aurata* and *Clythra 4-punctata*: two or three of the species mentioned seem to be occasional visitants rather than true ant's-nest beetles.

Many additions have been made to this list since the time at which it was published; among them are several Trichopterygidæ, as *Ptenidium formicetorum*, *Ptenidium Kraatzii*, and *Ptilium myrmecophilum*, and also *Scydmaenus Godarti*, *Batrisus venustus*, *Myrmedonia plicata*, &c. Dr. Power, by packing moss into the entrance of nests of *Formica fuliginosa* and leaving it for awhile, and then taking it out and shaking it over paper, and at the same time carefully examining the runs, found several good species, notably the very rare *Ilyobates glabriventris* and *Microglossa gentilis*; by the same method he also found *Homœusa acuminata*, *Corticaria serrata* in abundance, and *Atomaria fimetarii*. Certain Hemiptera, as *Piezostethus formicetorum*, also live in ants' nests, as well as a few insects of other orders.

The nests should not ruthlessly be pulled to pieces; at the same time if the locality is not near enough for a collector to visit it more than once or twice in the course of a season, it is a good plan to secure a large bag or two of refuse from the centre

of the nest, and examine it carefully at home; in fact, some of the minuter species cannot be easily found except by this method.

In conclusion, there are one or two localities that have produced many species in other countries, but as yet, perhaps from the fact that they have not been worked, have not had a single species recorded from them as British; the chief of these are the bone-caves, from which a great number of new species have been taken (belonging to the genus *Adelops* and others), on the Continent. Any collector who lives near one of these caves will do well to examine their innermost recesses carefully, and he may find several new species at any time; the genus *Anillus* apparently lives under great boulders, and where practicable, in cases where such are being removed for any purpose, the ground underneath should be closely searched.

Much more might be said on almost all the subjects that have been treated of in these papers; it is, however, hoped from letters and communications received that they have been of some help to those many collectors who seem to be taking up the study of Coleoptera, and that they may lead a few, at any rate, to begin a study which, although it may appear a little dry and hard at first, becomes more and more interesting and fascinating at every step advanced, and which, when once its first difficulties have been mastered, is very seldom given up by any of its followers.

The School House, Lincoln, March 9, 1883.

NOTES ON SEASON 1882.

By W. H. WRIGHT.

I SHOULD like to add my testimony to that of the many who have commented upon the scarcity of Lepidoptera during the above year, and in enumerating some of the insects met with throughout the season to offer a few remarks upon the alleged scarcity.

Until the disastrous salt-laden wind which occurred in ^{April 29} May, when most of the trees and hedges were more than usually forward, larvæ of the common species abounding in Epping Forest appeared to be very abundant. Among those which fell freely to the beating-stick I noticed *Hybernia defoliaria*, *Phigalia pilosaria*, *Miselia oxyacanthæ*, *H. aurantiaria*, *H. leucophearia*,

Nola cucullatella, *Diloba cæruleocephala*, and *Scopelosoma satellitia*. After the storm of wind mentioned larvæ were as scarce as they had before been plentiful, and it was with difficulty that I obtained a sufficient number of *D. cæruleocephala* to form a short series, common as that moth usually is on the hedges and black-thorn bushes bordering the Forest.

It was not until collecting the imagines of usual summer species commenced that the scarcity was so marked, and to a beginner in this branch of natural history it could not but prove disheartening, and unless imbued with a considerable amount of perseverance and determination he would run the risk of abandoning a pursuit which appeared so unprofitable from a collector's point of view.

Having made up my mind, at the solicitation of a friend, to reside in one of the best parts of Epping Forest for some short time in May and beginning of June, we did so, and further resolved to do our best towards filling the blanks in our collections. A few *Cidaria suffumata*, *Anticlea derivata*, and *Odontopera bidentata* were secured, and very few of such common insects as *Panagra petraria*, *Cabera pusaria*, &c. That which struck us as forming a most marked contrast with the prevailing scarcity was the abundance of *Fidonia atomaria*, which swarmed in every direction. *Platypteryx unguicula* appeared, however, as usual. Among the Noctuæ on the wing were *Xylophasia rurea*, *X. hepatica*, and a more than usual number of *Erastria venustula*; but on sugar the only one which put in an appearance was *Gonoptera libatrix*.

During our stay we visited that favourite collecting ground of the late Mr. Doubleday, viz., Ongar Park Woods, in search of Diurni, and there we found *Argynnis euphrosyne* on the wing in fairly large numbers, as also were *Hesperia alveolus*, *H. tages*, and *Anthocharis cardamines*. My friend secured a fine variety of *Tephrosia biundularia*. *Macroglossa fuciformis* was taken in good condition; and near the same locality, soon after, *A. selene* and the small Noctuas *Phytometra ænea* and *Euclidia mi* were very plentiful.

By the above remarks it will be seen that such insects as have arboreal larvæ were scarce, while those which fed during the previous autumn on or near the ground were fairly represented. This scarcity of imagines of tree-feeding species, therefore, must have been due to the high winds which prevailed during the autumn of 1881.

During a week's stay in Sussex, near Eastbourne, at the end of June, we found the same scarcity repeated among Geometræ in a marked degree, but such Diurni as should be out at that time were tolerably plentiful. *Argynnis selene* had been very numerous, judging from the large number of worn specimens upon the wing, and *Hesperia sylvanus* was fully represented, and as quarrelsome as usual. *Melitæa athalia*, although not numerous, was still not scarce, and a good series fell to my net, and, probably, had the sun shone more frequently a larger number would have been visible; and I also learned that a little later on *Argynnis adippe* and *Arge galathea* were in abundance. Upon the Downs *Lycæna adonis*, *L. alsus*, and *L. alexis* were on the wing, but not in large numbers, as the sunshine was very sparing.

Among the Noctuæ at sugar we found, some in fair numbers and others abundant, the following:—*Grammesia trilinea*, *Leucania comma*, *Hadena dentina*, *Gonoptera libatrix*, *Agrotis exclamationis*, *Aplecta nebulosa*, *Thyatira batis*, *T. derasa*, *Miana strigilis*, *Xylophasia polyodon*, &c.; but more sparingly *Acronycta aceris*, *Cymatophora or*, and *Diphthera orion*. Although among the Geometræ we took *Asthena sylvata*, *Angerona prunaria*, *Metrocampa margaritata*, *Timandra amataria*, *Boarmia repandata*, *Tanagra chærophyllata*, and others of common occurrence everywhere, yet they were few and far between.

During the summer, in the vicinity of London, I noticed that such Noctuæ as *Agrotis segetum*, *Axylia putris*, *Noctua plecta*, *Miana strigilis*, *Mamestra persicariæ*, *N. rubi*, *M. furuncula*, *Caradrina morpheus*, *M. brassicæ*, *Orthosia upsilon*, *X. lithoxylea*, *X. polyodon*, and many other Noctuæ whose larvæ feed on low-growing plants, and such of the Geometræ as feed upon herbs, as *Larentia didymata* and *Melanippe hastata*, were nearly as numerous, and in some instances more so than in previous years.

In observing these facts it leads me to the conclusion that a mild wet winter is not so destructive to such moths as pass the winter either as hybernated larvæ underground, or well-protected pupæ in a similar position.

I agree fully with Mr. Kane in his remarks in the 'Entomologist' (Entom. xv., p. 245; xvi., p. 53) that the paucity of such species whose larvæ feed on trees was due to the windy weather of 1881, and I concur in his belief that a mild winter

is not so destructive to pupæ and hybernated larvæ as is generally supposed.

The damp has no doubt a fatal effect upon some pupæ, as many collectors know, yet my experience—although short—goes to prove that larvæ select such dry sites for pupation that a little damp more or less makes very little difference. Most of the Noctuæ which I have enumerated as being well represented will prove this—*e.g.*, *E. venustula*, although never numerous in Epping Forest, yet it was as well represented as in former years, thus proving that the mild winter had no effect upon the snug cocoons at the roots of the *Tormentilla reptans*. Again, that ubiquitous *Noctua xanthographa*, which, having passed the winter in the larval state, came out in such large numbers as to prove a perfect pest at sugar during August, thus tending to prove that the mild winter had little effect upon such insects as hibernate in the larval state.

Although I feel diffident in venturing to differ from Mr. Kane, yet I cannot but disagree with him in regard to the depredations made by beetles, centipedes, and other predaceous insects. My experience tends rather to prove that they are little to blame, as they are not very active or voracious during the winter.

It is a well-known fact that many moths will not emerge from the chrysalis state in the absence of certain atmospheric conditions, and, looking at the low average temperature and want of direct sunshine experienced during the past summer, it is only reasonable to hope that many species which should have emerged are now awaiting the coming summer in order to appear.

I trust that by the above remarks I have proved that the absence during last year of such Geometræ as feed upon trees or bushes is almost wholly attributable to the winds of 1881 and the violent wind storm of May, 1882, they having doubtless destroyed most of the young larvæ then feeding, and that the mild winter did not make such a marked difference in those species whose habit it is to seek the shelter of the earth or the bark of trees either in the larva or pupa state.

Inland Revenue Department, Somerset House, London, March, 1883.

SALLOWS.

BY JOHN T. CARRINGTON, F.L.S.

IT has ever been my desire since taking charge of this magazine to offer through its pages such notes or longer articles as might lead the younger students of Entomology, especially of Lepidoptera, to take greater interest in our favourite study. With this object I write the following lines, further hoping that some of our older correspondents may be reminded that the time has come to renew series of those insects which it is always a pleasure to meet with at this season of the year, after our long entomological hybernation.

Naturally in the early spring the lepidopterist thinks of sallows. Although much ought to have been done by the beginner in working up those species of the genus *Hibernia* which appear in spring, such as *H. leucophearia* and *H. progemmaria*, as well as *Anisopteryx æscularia*, besides that common hedgerow species *A. rupicapraria*; and even, still, if the sallows are not in full bloom, as will be the case now in the North of England, sugar will be found for a short time most attractive. At sugar, on mild evenings in February and March, in woods and plantations, most Noctuæ which have hybernated may be taken in fair condition. In addition, should there be birch trees in the neighbourhood, we may reasonably hope to find *Cymatophora flavicornis* in some numbers, as well as *Tæniocampa munda* in many forms, and some varieties are worth looking for. This last species is taken usually in much finer condition at sugar than at sallows, being about the earliest to appear of the genus *Tæniocampa*.

It is doubtful whether the word "sallows" causes as much pleasure in the mind of the botanist as it does to that of the entomologist, as much difficulty is found in defining the varieties. If I remember rightly there are some twenty-seven species in the genus *Salix*; but to the lepidopterist the chief interest lies with those which flower most and longest. This applies to those fine upright shrubs which ornament our woods in early spring with the brilliant yellow blooms of the male plants, for the flowers of female shrubs in this genus are usually green in colour. Each sex seems attractive to moths, but personally I have generally found the latter the more attractive.

The blossoms of plum and damson trees, in suitable localities, are almost as tempting to insects as are the willows; and at blackthorn bloom in the New Forest, two or three seasons ago, I found moths feeding plentifully after dusk; but as the bushes did not bear more than searching I could not say whether moths get as stupefied on the nectar of blackthorn as their neighbours on that of the willows.

At spring bloom we have our good nights just as at our summer and autumn sugaring, only I think we have more bad nights in spring than at other times of the year, if we except such wretched seasons as the last, which in some localities produced bad nights, and bad days as well, all the year long. East winds are much against us in the spring, and may be looked upon as the chief enemy for the time of the collector. An old northern saying runs, "When the wind is in the east, it is good for neither man nor beast;" and as we ought to accept the modern term, "animal," as applied to every creature possessing the power of locomotion, certainly moths may be classed among the beasts, as regards east winds. When, however, we get a dark night with a soft south wind, with just enough moisture in the air to verge upon our calling it rain, we may go to our woods, when the willows are in bloom, and expect a good night.

Those willow bushes which are isolated, and where there are not too many, are the best, and moths seem rather to favour those which are not too high; although I have had some really good nights at bushes which might almost be called trees. These are best worked, as are all which are clear from undergrowth, with an ordinary bed-sheet. While spreading this under the bush we must take care not to disturb the tree in the least, or even to turn our light on the catkin-bearing branches. All being ready, a sharp shake will cover the sheet with a variety of moths, which stay still for some time in half-inebriated condition. Of course the genus *Tenocampa* is strongest in representatives, though this depends much upon the locality in which we work. In a good old fir plantation we may expect our visitors to be chiefly *Trachea piniperda*, which, contrary to the sullen habits of the species of the above genus, go tumbling about "heads and tails," performing most absurd acrobatic feats before settling down to be quietly boxed. When I went for my first series of this species how astonished was I to see some

hundred or hundred and twenty specimens come tumbling into the sheet, and all commence skipping about as though for mutual amusement.

In oak woods in the South of England we may expect several good species: first there are the hybernated *Hoporina croceago*, *Dasycampa rubiginea*, or even the very rare *Cerastis erythrocephala*. If we have the luck to get a female of either of these it is well to save and even sacrifice a specimen, by allowing it to damage itself too much for cabinet purposes, on the chance of obtaining eggs. In the case of *H. croceago* it may be kept alive for some weeks in a box with a few dead oak leaves, if fed with sugar and water. Others, which have lived through the winter in the perfect state, are *Xylina semibrunnea*, *X. petrificata*, and *X. rhizolitha*. Eggs from any of these are useful, especially the two former, which are much wanted by northern collectors. The sugar and water treatment applies to all these cases, and it is best to turn in both sexes together, as the pairing of these hybernated Noctuæ appears to take place in spring rather than in autumn.

The species of the genus *Tæniocampa* are generally easily distinguished, even by artificial light and before boxing, unless we except *T. populeti*, which may be overlooked for dark *T. stabilis*. The former species is found in places where aspen (*Populus tremula*) grows, and should be carefully watched for in such localities. Excepting *T. leucographa*, *T. populeti* is now the rarest moth of the genus; although I remember in my early collecting days how we used to walk seven miles each way for seven nights in the week in search of the then rare *T. opima*, and if we got four specimens during the whole night's work of five or six hours we were so elated as to forget that we were tired. That was before our *confrères* of Liverpool had found that this species occurs commonly on the sandhills at Wallasey. There they are found by searching the low herbage, especially the dwarf roses (*Rosa spinosissima*), at night with a lantern. In this way I have taken as many dozens in a couple of hours as we used to take individuals in a season at the Yorkshire sallows. *T. leucographa* is a good moth, and appears to be more northern in its range in England than most of the other members of its family. I found it one season at Bishop's Wood, near Selby, in Yorkshire; the night was very wet, and the sallows could only be searched and not shaken, so that I got less than a dozen specimens.

I have never used a "Bignell" beating-tray for working sallows, but should think its shape very suitable. An inverted old umbrella, the larger the better, is most generally used, being portable, and not such back-aching work as the sheets. A man must be an enthusiast to work the latter for a whole season, especially if by himself, for the trouble of spreading, refolding, and carrying a generally wet sheet, would almost be punishment severe enough for a member of the Fenian "inner circle."

Of the odd species to be found at sallow bloom one would hardly expect to find butterflies at night. We have, however, heard of *Pieris napæ* falling, very drunk, and once of a *Vanessa antiopa*, but to hunt at night, and at sallows, for this rarity is a very roundabout and improbable way of getting it. A number of Geometræ may be so obtained, but these are either more abstemious than the grosser Noctuæ, or are less susceptible to the nectar, for on shaking the bush they usually fly away, and seldom fall an easy prey to the collector; of them amongst oak, *Eupithecia abbreviata* is sure to occur. On occasions we may meet with hibernated *Cidaria psittacata* and *C. miata*, or *Scotosia dubitata*. All the spring species of this division out at the time turn up now and then, and these include *Lobophora lobulata*, *Cidaria suffumata*, *Anticlea badiata*, and the very pretty *A. derivata*; *Aleucis pictaria* has also occurred at sallows in Essex. Of Tortrices, the oak-feeding *Sarrothripa revayana* occurs, but generally worn; females of this species may be "sleeved" on oak boughs, in some place where they will not be disturbed, and so fine examples of the next generation obtained.

If one arrives too early for the night-flying Lepidoptera, or wants work during the day, it is well to watch the bloom during sunshine for the wild-flying *Brephos parthenias*, or rarer *B. notha*. On dry days the catkins, which are getting over, should be shaken off and gathered for larvæ, which feed in them; these may be placed in a bandbox, over which muslin has to be stretched. This may be done by knocking out the lid, and placing the rim over the muslin. From these catkins a large number of species may be reared, such as *Xanthia cerago*, *X. silago*, *Epunda viminalis*, *Eupithecia tenuiata*, &c. Again young shoots of sallow should be assiduously gathered, especially when spun together by some slight web. These need not be examined when collected, but if fresh food be added from time to time, so long as any larvæ

be seen, a great number of most interesting species will be reared. Among the best species I have bred in this way was *Lobophora sexalata*, as also *Tethea retusa*.

Sallows come into bloom much according to locality, and whether the season is forward or late. I have seen sallows well out in the southern counties at the end of February; while in the Highlands of Scotland I had a grand night's collecting at them on the 17th of June, as described by me in the 'Entomologist' (Entom. ix. 272). The collector should, therefore, go by daylight, first to see if the bushes bear catkins, and better still to mark their position, and so save much time and trouble at night.

On nights unsuited to moths feeding at the sallow catkins, the collector's time may be employed by searching the herbage and twigs of trees for moths at rest. Of course no such bags as are made from the sallows must be expected; nevertheless many species may be added to the collection in this way, and some quite unexpectedly. Spring-feeding larvæ, especially on the low sallow bushes and dwarf sallow, will fully occupy our time, and by no means unprofitably.

I hope that the randomly written lines just penned may induce some collector to work with success during the coming spring, and better still to tell us in these pages of his good luck.

Royal Aquarium, Westminster, S.W., March 21, 1883.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

EPPING FOREST.—The Legislature has again resolved that Epping Forest shall be kept "unenclosed and unbuilt on, as an open space for the recreation of the public," and has decreed that an unnecessary railway through its already too small confines is neither calculated to "preserve the natural aspect of the Forest," nor is it in accordance with either the letter or spirit of the Epping Forest Act, 1878. Thanks to the good work done by the Commons Preservation Society and to the energetic action taken by the officers of the Essex Field Club, ably seconded by most of the Natural History Societies within and in the neighbourhood of the metropolis, the Great Eastern Railway (High Beech Extension) Bill, 1883, was defeated in the House of Commons on its second reading by 230 votes against 82, on March 12th last.

We are disposed to think that the leading journal expressed public feeling generally in the following paragraph:—"The vote of the House of Commons has smashed, pulverized, and utterly destroyed the wanton attempt of the Great Eastern Railway—supported, we are sorry to think, from not too disinterested motives by the Corporation of London, the appointed Conservators of Epping Forest—to ruin the seclusion of the most picturesque part of the Forest by driving a line from Chingford to High Beech. . . . The despised entomologists will now be able to pursue their butterflies in peace, and the lovers of the sylvan scenery which never palls, as Lord Beaconsfield said, will be able to enjoy the solitude of the Forest without being disturbed by the intrusion of an embankment which would only be more offensive if, as Sir Thomas Chambers suggested, a futile attempt were made to make it look like a natural undulation of the ground" ('Times,' March 13th, 1883). The founder of this Journal once wrote, "When I am gone to that place from whence there is no return; when this little effort is defeated by the hand of the aggressor; I trust some future entomologist may engrave on my tombstone, 'He *tried* to save the People's Forest for the people.' I desire no better epitaph" (Entom. v., 306, and cf. vol. viii., pp. 1—4). How it would have rejoiced him to have thus found the Forest really confirmed to the people; and after so brilliant a victory on behalf of the people's rights, how he would have prided himself on being one of the "handful of aristocratic bug-hunters" to whom Mr. F. W. Buxton so tenderly alluded in his speech in favour of the Bill.—E. A. F.

DIURNI IN CORNWALL.—At Truro last year I found Diurni more abundant than would have been expected owing to the badness of the season generally. The following I captured there during a fortnight in August and a week in the middle of September:—*Vanessa urticae*, *Pyrarga egeria*, *P. megæra*, *Satyrus semele*, *Epinephele janira*, *E. tithonus*, *Thecla quercus*, *Polyommatus phleas*, *Lycena icarus*, *L. argiolus*, *Rhodocera rhamni*, *Pieris napi*, *P. rapæ*, *P. brassicæ*, and *Hesperia linea*, all abundant. I also met with, but not abundantly, *Argynnis paphia*, *Pyrameis atalanta*, and *Epinephele hyperanthus*.—E. F. BENSON; Lambeth Palace, London.

NOTODONTA CHAONIA.—On April 10th, 1882, a friend and myself made up our minds to spend Easter Monday at Tilgate

Forest, with the hope of finding *Endromis versicolor*. To make up for our disappointment in not finding that species, I found a female *N. chaonia*, in fair condition, sitting quietly on a branch of the birch. I took it home alive. The next morning it laid a good batch of eggs; on April 27th they hatched, thirty-three in number; by the time they were full-fed twenty-seven went to earth, that being from June 20th to 28th. Perhaps it may interest some to know the colour of the young larva, as authors only give the description of the adult larva. The markings are the same, but the colour is very different, being a very bright pea-green, with the stripes before the last change bright yellow.—M. PHIPPS; Soutboro' Brewery, Tunbridge Wells.

DESCRIPTION OF THE LARVA OF *MIANA STRIGILIS*.—The larva of this very common moth seems so little known to lepidopterists generally that it may be advisable to give a description of it. It may readily be found from the middle to the end of April ensconced head downwards within the stems of *Dactylis glomerata*, or on damp evenings, like others of the genus, exposed on or near the top of the blades of this and other grasses. Length when at rest about three-quarters of an inch, but when crawling quite an inch, and is tolerably plump in proportion. The head has the lobes rounded, and is smaller than the second segment; body cylindrical, tapering a little towards the head, but attenuated considerably towards the anal extremity; skin semi-translucent, nearly smooth, has a tough appearance, and is clothed with a few minute hairs. Ground colour dull purplish-brown; the head, legs, frontal and anal plates, glossy pale brown; medio-dorsal and subdorsal stripes very distinct, dull pale yellow; there is also an indication of another but much less distinct pale line between the subdorsal and spiracular regions; there are no perceptible spiracular lines. Spiracles large and very distinct, they are nearly round, but slightly oblong, and intensely black. Ventral surface uniformly dull pale yellow.—GEO. T. PORRITT; Huddersfield, March 8, 1883.

LARVÆ OF THE BRITISH PTEROPHORI.—I am still wanting larvæ of several of our plume moths for observation and the completion of the history of this family now appearing in the 'Entomologist,' among which I may mention *Platyptilia bertrami*, which feeds in young shoots of yarrow (*Achillea*) in May and June). *P. isodactylus*, feeds in stems of water ragwort (*Senecio*

aquaticus) in May and again in August; *P. zetterstedtii*, which probably feeds in the stem or shoots of one of the Compositæ growing in woods, possibly golden-rod (*Solidago virgaurea*) or a species of *Senecio*; *Amblyptilia acanthodactylus*, to be found feeding on several low-growing plants in June and July. I once found a larva on geranium in a garden at Ealing in August. Should any entomologist obtain larvæ of either of the above species, or any other not yet described in this series of papers, I shall be greatly obliged if he will kindly favour me with a couple for figuring and description. It is well to remember a locality where imagines of a plume moth of which we require larvæ have been observed, for there, if we only know the food-plant, we may commence the search with some degree of confidence as to the result. Of course a knowledge of such data would help considerably in the finding of the larva of any species of Lepidoptera, but, considering the very sluggish and stay-at-home habits of the majority of the "plumes," I submit that without some idea of the exact spot where such insects as *Leioptilus lienigianus*, *Oxyptilus teucarii*, and *Mimæseoptilus phæodactylus* occur, searching the food-plant for the larvæ of either species would usually be unsuccessful. I do not imply that it is useless to search for the larva of a species if we are not aware of the imago having occurred in the neighbourhood of the food-plant; on the contrary, such searching might result in adding new localities for some of our rarer Pterophoridæ.—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood, London, N.W., 1st March, 1883.

ÆCHMIA DENTELLA NEAR CROYDON.—I have pleasure in recording the capture of twenty fine specimens of this rare insect from a hedge of very mixed growth at Crombhurst, near Croydon. The specimens were taken from the first to the second week in June last, being then in beautiful condition. I also met with a few *Phoxopteryx derasana*, one *Phtheocroa rugosana*, and three *Ecophora trisignella*.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., March 16, 1883.

MUTILLA RUFIPES.—One morning last June or July (I am not sure which), whilst returning from Stakes Wood, on the edge of a small copse between Stakes and Purbrook I found a wingless insect, of which I enclose a sketch. The description is as follows:—Head black, thinly covered with black hair. Two

compound eyes, placed a little behind the antennæ, and without any trace of ocelli. The antennæ resemble those of the mason bees. Thorax: the prothorax black, the meso- and metathorax red. The whole is thinly covered with black hair. The legs are black, and there is no sign of elytra or wings. Abdomen black, with the exception of a white spot on the first segment, and two placed opposite to each other, one on either side near the anal segment. The spots are thickly covered with silky white hair, and the remainder of the abdomen with black. If any reader of the 'Entomologist' can inform me to which order it belongs, with its name, I shall be obliged.—W. T. PEARCE; Buckland, Portsmouth.

[I have little doubt but that the insect described and figured by Mr. Pearce is the female of *Mutilla rufipes*, Latr. (= *ephippium*, Fabr.), a somewhat local species of fossorial Hymenoptera which is supposed to be parasitically attached to humble bee (*Bombus*) nests.—E. A. F.]

ASILUS CRABRONIFORMIS.—I have repeatedly seen it stated that *Asilus crabroniformis* sucks the blood of animals, and Miss Ormerod gives it as injurious to agriculture. Can anyone prove the above statements? The *Asilus* of the Romans (Mr. MacLeay observes) was the *Æstrus* of the Greeks and the *Hæmatopota* of the present system, a fly exceedingly annoying to horses, whereas our *Asili* prey on other insects, especially the Diptera. They prefer resting on the ground, particularly in sandy situations, and the larvæ feed upon the roots of plants underground, where they change to pupæ covered with spines. I believe it is as erroneous to call *Asilus crabroniformis* a blood-sucker as it is to call an *Æschna* a horse-stinger, as is done in various parts of England.—C. W. DALE; Glanvilles Wootton, Sherborne, Dorset, March 11, 1883.

EARLY BEES.—The present month not only came in like a lamb, but brought with it also a few bright and very warm spring-like days, causing the country to put on quite a vernal appearance. On the 4th inst. I saw two specimens of *Bombus virginialis* disporting themselves along the hedge-banks in the morning sun, and on the 5th, an equally bright and pleasant day, I saw several specimens of this same *Bombus*, as well as a *B. pratorum*. The same afternoon six or seven males of *Anthophora acervorum* were seen darting in and out among a

small bed of wallflowers just coming into blossom. After this we had a continuance of cold easterly winds and snow storms till the 14th, which was another bright and spring-like day, and tempted these bees forth again; honey bees too were particularly busy among the crocuses this day. Now came more cold blows, and at the present moment instead of spring we have winter in all its grim and stern reality.—V. R. PERKINS; Wotton-under-Edge, March 20, 1883.

NOTE ON THE GENUS *HEMIDEINA*.—Notes on the habits of that somewhat obscure race of insects included in the genus *Hemideina* and its allies will probably be an interesting subject to your readers. The following I do not offer as anything very complete, but merely as the experience of the last six months. These insects inhabit only one species of tree in the forest that I know of, viz., *Melicytus ramiflorus*, or, as it is commonly called, the locust tree. They form tunnels through the main stem and branches, having holes communicating with the exterior at various distances up the tree. There is also generally a large cavity at the base close to the ground. The diameter of the tunnels is mostly under six lines; the largest I never found over nine. The trees containing specimens may be readily told by the presence of the above-mentioned holes. To extract one of these insects without injury is no easy matter, but is most successfully done by the following method:—First procure a small axe, and cut in about three-quarters through the trunk, just below one of the holes; then insert the axe so as to split the wood off in long pieces, thus removing one side of the tunnel. The first thing seen on approaching an insect will be two red threads, which are the antennæ laid over its back behind it in the tunnel. An incision then made about ten inches below, and the piece split off, exposes the insect to view in its tunnel, which is frequently filled with *débris* containing various small insects, such as *Blattæ*, &c. The width of the gallery seldom exceeds that of the creature's head; the great posterior legs are stretched out behind, and by prizing against the floor of its burrow serve to propel it; the fore-legs are placed in front, and are firmly fixed by the tarsal claws, and thus pull the insect at the same time as the hind and intermediate ones push, so that it is enabled to proceed at a considerable rate down these holes. The mobility of the body is

something wonderful, adapting itself to the shape and size of the cavity in which it happens to be, and thus it is that one of these insects can go through any hole that is large enough to admit its head. When it is fairly out of the tree it endeavours to escape—if a female—by jumping away about three feet at a time and seeking concealment amongst the various litter on the ground; but if a male it is much more ferocious, thrusting its hind legs up in the air, clinging firmly to the tree with the other two pairs, and biting very violently anything presented to it; and both sexes emit a peculiar grating sound when disturbed. These insects evidently leave their tunnels of a night and roam about the trees, as I found the crop of one I dissected for stuffing full of particles of green leaves; in the lower parts of the alimentary canal I found half-digested wood. I should mention that these insects make their tunnels *always* in *living* trees, and are not found in rotten wood, as some imagine. The above are sketches from the habits of *Hemideina capitolina* and *megacephala*, these being the only species I have as yet seen.—GEORGE V. HUDSON; Karori, Wellington, N.Z., Dec. 30, 1882.

REVIEW.

Catalogue of British Coleoptera. By Rev. W. W. FOWLER and Rev. A. MATTHEWS. West, Newman & Co. 1883.

WE have read with great satisfaction this catalogue of British Coleoptera. However far it may fall short of perfection, a point perhaps impossible to attain, there can be no doubt that it is an improvement upon all previous ones, and a long step in the right direction. For many years past we have been accustomed to hear from every quarter complaints of the faultiness of our present systematic arrangement, but until lately no one has had the courage to inaugurate any decided improvement. During the past year, however, Dr. Horn, on the other side of the Atlantic, commenced the attack by his revision of the Carabidæ, a work which only requires careful study to be well appreciated by every entomologist, and we are glad that Dr. Horn's system has been adopted in the present Catalogue. Again, it appears to us that a great improvement in classification has been effected by following the views of Dr. Leconte, and removing the

Rhyncophora from the abnormal position which they have hitherto held, and placing them as an isolated group at the end of the list. In their previous position the Rhyncophora stood as a "parenthesis," so to say, or rather an intercalation, between groups intimately allied to each other, but with no link in common between them and the Rhyncophora.

Another manifest improvement is accomplished by placing the Heteromera at the end of the Stomatophorous Coleoptera, since they form, though it may be in mimicry, an epitome of all the preceding series. In the complex series of the Clavicornia another great improvement has been made by a slight alteration in the position of the Staphylinidæ, and also by the introduction of the Coccinellidæ and their allies who there find a home much better suited to their characters than any vicinity to the Chrysomelidæ could offer. In fact, the whole Clavicorn series seems to be arranged on a better linear plan than has yet been adopted, and this is due in a great measure to the large amount of careful dissection which we understand to have been done by Mr. Matthews expressly for the Catalogue. We think that the new introductions have been carefully inserted, and also that good judgment has in general been exhibited with respect to the species omitted and those pronounced dubious, but think that more might with advantage have been placed in the latter category. We should have liked to see some distinction made between those insects which are indigenous or otherwise, but it is very difficult in many cases to draw the line between truly native and doubtfully introduced species, and especially those which have become completely naturalized. A great improvement is made on some former catalogues by the addition of the author's names to the genera.

There is a copious index, without which no reference Catalogue can be really complete. The type is excellent, and the work has been carefully got up and well executed by Messrs. West, Newman and Co. We congratulate the authors on the publication of their Catalogue, and can thoroughly recommend it to the attention of our readers.

J. A. P.

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[No. 240.]

DESCRIPTIONS OF THREE NEW SPECIES OF COLEOPTERA (*NITIDULIDÆ*) FROM CERAM.

BY A. SIDNEY OLLIFF.



LASIODACTYLUS STELIDOTOIDES, Olliff.

a. Antenna. b. Tarsus.

THE three species of Nitidulidæ described in the present paper are from Ceram; by whom they were collected I cannot ascertain; when they came into my possession I received no information respecting them except as regards their locality. Of one of them (*L. stelidotoides*) I have seen in various collections specimens from Gilolo, Ceram, and Macassar; these latter were, I believe, collected by Mr. Wallace. A wood-cut of this species is given above; the other (*L. notabilis*) will be figured in Mr. Waterhouse's 'Aid to the Identification of Insects' now being published in quarterly parts.

CARPOPHILUS, Stephens.

Carpophilus assimilis, n. sp.

Elongate, slightly more attenuated in front than behind, rather convex, shining black, very sparingly covered with short black pubescence. Head rather large, transverse, extremely finely and closely punctured. Clypeus less closely but equally finely punctured. Prothorax in front considerably broader than the head, transverse, very finely and closely punctured; anterior

angles very slightly obtuse; sides gently rounded in front, parallel for the posterior two-thirds; posterior angles right angles; with two feeble impressions on each side at the base. Scutellum transverse, rounded behind, finely and closely punctured in the centre, the margins impunctate and shining. Elytra a little longer than the prothorax, disc rather flat, anterior angles very slightly obtuse, sides subparallel; apex of each elytron obliquely truncate. Abdomen with two segments exposed, finely and very closely punctured. Under side finely punctate. Antennæ and legs pitchy brown. Length $3\frac{1}{2}$ mm.; width 2 mm.

This species closely resembles *Carpophilus fusus*, Murray (Trans. Linn. Soc. xxiv. p. 370). It may be distinguished by its shorter and broader prothorax, more shining surface, and more regularly and less closely punctured elytra.

LASIODACTYLUS, Perty.

'Delectus Animalium,' 1830, p. 34.

Lordites, Erichson. Germ. Zeitschr. Ent. 1843, iv. p. 316.

Herr Reitter has pointed out that these genera are synonymous (Verh. Ver. Brünn. xii. p. 86).

Lasiodactylus notabilis, n. sp.

Cuneiform, much broader in front than behind, brown, somewhat shining, the margins broad and yellowish testaceous. Head transverse, embedded within a semicircular emargination of the prothorax, rather finely and moderately closely punctured and deeply impressed in front, more closely punctured at the base. Clypeus rather finely and closely punctured, with a slight elevation at the base. Antennæ testaceous, the club darker. Prothorax at the base more than twice as broad as long, narrower in front than behind, moderately finely and rather closely punctured, deeply emarginate in front; anterior angles slightly obtuse; sides rounded; posterior angles acute, slightly produced and reflexed. Scutellum transverse, rounded behind, rather finely punctured. Elytra about twice as long as the head and prothorax together, as broad at the base as the prothorax, narrowed behind, rather finely striate-punctate, except the apex which is smooth, the interstices raised, moderately broad, and impunctate; anterior angles obtuse; sides oblique, rounded behind, margins finely punctured and slightly reflexed, abbreviated posteriorly; with a deep impression on each side at the base: each elytron with an

obscure testaceous spot on the disc, before the middle, united to the shoulder by a narrow testaceous line, and another similarly placed spot just behind the middle. Under side shining pale testaceous, the sterna very finely and irregularly punctured, abdominal segments still more finely punctured. Legs pale testaceous. Length $5-6\frac{1}{2}$ mm.; width of prothorax $3-3\frac{3}{4}$ mm.

This insect, in its attenuated form and peculiar sculpture, differs from any previously described species of the genus. In one specimen the testaceous stripes at the base of the elytra are considerably broader than in the others, the discal spots are also proportionately larger.

Lasiodactylus stelidotoides, n. sp.

Lordites stelidotoides, Murray in litt.

Oval, about twice as long as broad, pitchy brown, very sparingly clothed with very fine yellowish-grey pubescence; the margins narrow, reflexed and rather finely punctured. Head transverse, finely and closely punctured. Antennæ with the apical joint testaceous. Prothorax at the base more than twice as broad as long, rather narrower in front, moderately closely and finely punctured; anterior margin strongly emarginate, the sides of the emargination oblique; anterior angles slightly obtuse; sides arcuate; posterior angles slightly acute. Scutellum transverse, rounded behind, very finely and closely punctured. Elytra about twice as long as the head and prothorax together, as broad at the base as the prothorax, moderately strongly striate-punctate, the alternate interstices rather wide and costiform; shoulders prominent; anterior angles slightly obtuse; sides arcuately narrowed to the apex: each elytron with two rather obscure dull red spots, one near the scutellum, the other on the disc, considerably before the middle, and a moderately distinct irregular lunate reddish marking just behind the middle, the convex side of which is towards the suture. Legs piceous, tarsi a little paler. Length $4\frac{1}{2}$ mm.; width 3 mm.

For this interesting species I have adopted the MS. name, *stelidotoides*, proposed for it by the late Mr. Andrew Murray. In form it is remarkably like a *Stelidota*, the absence of a posternal process will, however, at once remove it from that genus. I have made a careful dissection of the mouth-organs, and find that they agree with those of the genus *Lasiodactylus*.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. III.—CRYPTIDÆ (*continued*).HEMITELES, *Grav.*

SECTION 1.—Thorax and abdomen black.

DIVISION 1.—Spiracles of metathorax large and oval.

Abdomen subsessile; femora and tibiæ red, apex of hinder black (male). - - - - - 1. *breviventris*, 2½ lines.

DIVISION 2.—Spiracles of metathorax small and generally circular.

Metathoracic area generally complete and distinct.

A. Second segment of abdomen with no perceptible sculpture, or hardly any.

a. Entirely black (male). - - - 4. *tenebricosus*, 1½—2 lines.

b. Legs red, hind coxæ generally black at the base (male and female).
13. *similis*, 1½—3¼ lines.

Note.—This species is sometimes found with the abdomen more or less chestnut.

B. Second segment of abdomen with sculpture.

a. First segment aciculate, or longitudinally wrinkled; the 2nd more or less punctate, certainly so at the base.

* Legs fulvous, or straw-coloured.

† Front coxæ white.

‡ Face white (male). - - - 21. *chionops*, 2 lines.

†† Face not white; apex of hind tibiæ brown (males and females).

§ Styles of male not projecting; stigma whitish.

submarginatus, 1½—1¾ line.

§§ Styles projecting; stigma pale piceous. 14. *fulvipes*, 1½—2 lines.

†† Front coxæ pale fulvous (female). - 22. *infirmus*, 1¼—1½ lines.

** Front legs pale, hinder more or less brown.

× Supero-medial area complete (male and female).

23. *tristator*, 1½—2½ lines.

× × Supero-medial area not closed behind (male). - *obscurus*, 1½ line.

b. First and 2nd segments of abdomen punctate; 1st sometimes subaciculate.

* Greater part of the legs of the female red.

† Aculeus of female longer than the abdomen.

Legs red, coxæ and trochanters black; hind tibiæ of male partly black (male and female). - - 30. *melanarius*, 1½—2 lines.

†† Aculeus about as long as the abdomen.

‡ Hind coxæ black, front ones pale, at the most black at the base; front trochanters pale (female). - - 31. *pictipes*, 2 lines.

* Base of the 3rd segment more or less red; scape beneath yellowish; hind trochanters partly black (male). 33. *castaneus*, 1½—2 lines.

†† All the coxæ and trochanters red, or the former black, especially the hind ones, but front ones not pale (female). 32. *sordipes*, 1½ line.

- ** Front femora and tibiæ red, apex of hinder one black (male and female). - - - - - 20. *vicinus*, 2 lines.
- c. First and 2nd segments of abdomen coarsely aciculate; mouth and legs red; antennæ of female with a narrow white ring (male and female). - - - - - 41. *niger*, 3 lines.

SECTION 2.—Thorax black; abdomen black; apical margins of intermediate segments pale yellow.

First and 2nd segments aciculate; aculeus one-third of abdomen (male and female). - - - - - *marginatus*, $2\frac{1}{4}$ lines.

SECTION 3.—Thorax black; abdomen red and black; apex sometimes whitish.

Metathoracic spiracles small and circular.

A. Antennæ tricoloured (females).

a. Second segment and legs fulvous; apex of hind femora and tibiæ black; aculeus about one-sixth of abdomen. 3. *varicornis*, 1 line.

b. Margin of 1st and the 2nd segment red; last segments, legs and mouth stramineous; aculeus hardly half of abdomen.

18. *contaminatus*, 2 lines.

B. Antennæ bicoloured (white ringed) (females).

Segments 1st to 3rd and legs almost entirely red.

a. Abdomen smooth and shining; aculeus about half of abdomen.

biannulatus, $2-2\frac{3}{4}$ lines.

b. Abdomen finely and closely punctured; aculeus about one-third of abdomen; wings with a fuscous band behind the stigma.

subannulatus, $2\frac{1}{2}$ lines.

C. Antennæ black, or red at the base.

a. Second segment of abdomen without sculpture.

* Metathorax sloping from front to back, not angulated.

First segment long and slender; middle of abdomen reddish stramineous (†), or stramineous (††).

† Hind legs more or less dark (male). - - - 5. *imbecillus*, 2 lines.

†† Hind legs pale (male and female). - - - 7. *necator*, 1 line.

** Back part of metathorax almost at right angles to the front part.

† Stigma white at the base.

Middle of abdomen and greater part of legs red; aculeus about half of abdomen.

§ Coxæ black.

First segment of abdomen with deep, scattered punctures (male and female). - - - - - 27. *ridibundus*, $2\frac{1}{2}$ lines.

§§ Coxæ almost entirely red.

× First segment of abdomen aciculate; wings of female with fuscous band (male and female). - - - 11. *oxyphimus*, $2\frac{1}{2}$ lines.

× × First segment smooth; wings without band (female).

politus, about 2 lines.

†† Stigma not white at the base.

o Antennæ much thickened (as in *Phygadeuon*).

→ Abdomen lighter or darker chestnut; apical margin of anterior segments paler, and legs more or less pale, as well as base of antennæ; aculeus one-third of abdomen (female).

12. *crassicornis*, about 1 line.

- ++ Basal half of antennæ, middle of abdomen and legs red; aculeus two-thirds of abdomen (female). - *mixtus*, about $\frac{1}{2}$ line.
 oo Antennæ not thickened.
 ++ Metathoracic areæ complete and distinct.
 ∞ Legs almost entirely pale red; middle of abdomen more or less red or testaceous.

Segments 1st to 5th of abdomen and legs red; aculeus half the length of abdomen. - - - - *argentatus*, $3\frac{1}{4}$ lines.

Note.—Unfortunately Gravenhorst gives but little more than a colour description of *Hemiteles argentatus*, described from a specimen taken by Mr. Hope, probably in the neighbourhood of Netley. It was sent to Gravenhorst after he had written the second volume of his Monograph. The type specimen is now lost; if it had been in Gravenhorst's collection, Taschenberg would have noticed it. Professor Westwood has been kind enough to hunt through Hope's collection, and finds it is not there, adding that probably it was never returned by Gravenhorst.

- ! Back part of metathorax with two intermediate perpendicular lines.

1. Supero-medial area of metathorax about as broad as long, rounded in front, incurved below, wider in front than behind (male and female).

Aculeus one-third or one-fourth of abdomen.

6. *micator*, $1-1\frac{3}{8}$ line.

2. Supero-medial area much longer than wide (male and female).

Aculeus two-thirds of abdomen. - - - *gyrini*, 2 lines.

3. Supero-medial area transverse (female).

* Aculeus two-thirds of abdomen. - - - *persector*, $2-2\frac{1}{4}$ lines.

** Aculeus one-fourth of abdomen (female). - *ruficaudatus*, $2-2\frac{1}{2}$ lines.

- !! Back part of metathorax without intermediate perpendicular lines (female). - - - - - 8. *dubius*, $1\frac{1}{2}$ line.

∞∞ Front tibiæ, apex of front femora and segments 2nd to 6th red (male and female). - - - - 9. *tenuicornis*, $2-3\frac{1}{2}$ lines.

++++ Metathorax with only the two transverse lines distinctly defined (male and female). - - - - 2. *furcatus*, $1\frac{1}{2}-2$ lines.

- b. Second segment of abdomen punctured; 1st longitudinally wrinkled or aciculate.

* Metathorax with two transverse lines, space between them coarsely (†) or finely (††) aciculate; the supero-medial area undefined at the sides.

† Abdomen black, some of the segments with red margins.

‡ All the coxæ black; segments 1st to 3rd red-margined (male).

24. *limbatus*, $2\frac{1}{2}$ lines.

‡‡ Hinder coxæ black, front ones white; all the segments red-margined (female). - - - - 25. *conformis*, 2 lines.

†† Third segment red, and all the coxæ black (male).

rufocinctus, Gr., $2\frac{1}{4}$ lines.

Note.—This is not *Hemimachus rufocinctus*, Ratz.; and is not the male of *Pezomachus instabilis*, Foerst.

** Areæ of metathorax, especially the supero-medial area, distinct.

Back part of metathorax with two distinct intermediate longitudinal lines.

- § Second segment of abdomen very finely punctured.
 Segments 2nd to 4th and legs red; hind coxæ, apex of hind femora and tibiæ, also apex of hind tarsal joints, black; aculeus very short (male and female). - - - 15. *varitarsus*, 2 $\frac{1}{4}$ lines.
- §§ Second segment densely and coarsely punctured.
 Aculeus a little more than half of abdomen (females).
- × Segments 2nd to 4th red, sides brown; legs red; tarsi fuscous.
 16. *decipiens*, 2 $\frac{1}{2}$ lines.
- × × Abdomen red, apex black; legs and basal half of antennæ red.
 19. *melanopygus*, 1—1 $\frac{2}{3}$ line.
- × × × Segments 2nd to 4th chestnut; legs red, base black, as well as apex of hind femora and tibiæ; margins of segments polished.
 20. *vicinus*, 2 lines.
- c. Second segment punctured; 1st either punctured or smooth.
- * Metathorax moderately short, the back part almost perpendicular.
- † Punctures on 2nd segment very much scattered.
- ‡ Segments 2nd and 3rd more or less red; legs red; hind coxæ of male black, sometimes front ones also; aculeus about one-third of abdomen (male and female). - 28. *æstivalis*, 2—2 $\frac{1}{3}$ lines.
- ‡‡ Segments 2nd to 4th red or chestnut; femora and tibiæ red; aculeus about half of abdomen (female). 27. *ridibundus*, 2 $\frac{1}{2}$ lines.
- †† Second segment densely punctured.
 Aculeus of female nearly as long as the abdomen.
- § Middle of abdomen and legs red; coxæ of *castaneus* male, black.
- × Back part of metathorax with the intermediate longitudinal lines.
- o Base of flagellum of female red; aculeus straight.
 Sides of post-petiole of female slanting; 3rd segment of male more or less red, sometimes almost or quite black (male and female).
 33. *castaneus*, 2—2 $\frac{1}{2}$ lines.
- Post-petiole quadrate (female). - - - ? 33. *castaneus*, var.
- oo Antennæ black; aculeus curved downwards (female).
 34. *inimicus*, 2 $\frac{1}{2}$ —3 lines.
- × × Back part of metathorax without the intermediate lines; superomedial area almost pentagonal (female).
 35. *floricolorator*, 2—2 $\frac{3}{4}$ lines.
- §§ Base of 1st segment, base and apex of 2nd segment, femora, tibiæ and tarsi, almost entirely red; metathorax with only the two transverse lines. - - - - - *zonatus*, 2 $\frac{1}{2}$ lines.
- ** Metathorax elongated, without distinct areæ, the back part very oblique.
- + Back part of metathorax with intermediate longitudinal lines.
 First segment of abdomen almost smooth; 2nd shining, with feeble puncturing; back of 2nd to 4th segments red; legs reddish straw; apex of hind femora and tibiæ black (females).
 36. *fragilis*, 2 lines.
- + + Back part of metathorax without the longitudinal lines.
 Middle of abdomen partly red; base of antennæ red.
- ++ Legs red (male). - - - - 37. *monozonius*, 2 lines.
- +++ Legs red, hinder one partly black (male). *palpator*, Gr., 2—3 lines.
- d. First and 2nd segments aciculate, the latter sometimes smooth at the apex.

- * Second and 3rd segments red (†), or pitchy brown (††).
- † Femora and tibiæ red, hind ones black or brown at the apex.
- †† Front coxæ black (male). - - - 43. *scrupulosus*, 2½ lines.
- †† Front coxæ red; aculeus rather more than one-fourth of abdomen (female). - - - - - *distinctus*, 2 lines.
- †† Front legs pale yellow, hind ones brown; base of tibiæ pale yellow (male). - - - - - 39. *tenerimus*, 1½ line.
- ** Third segment of abdomen and front tibiæ red (male). - - - - - 40. *dissimilis*, 3 lines.
- *** Second to 4th segments of abdomen and legs red; wings with a dark brown band; aculeus one-fourth of abdomen (female). - - - - - *incisus*, 2¾ lines.

SECTION 4.—Thorax more or less red.

- A. Second segment of abdomen without sculpture.
Middle of abdomen and legs straw-coloured (male and female). - - - - - 7. *necator*, var.
- B. Second segment of abdomen with sculpture.
 - a. Wings of female with two or three dark bands (male and female).
 - * Abdomen black. - - - - - 26. *bicolorinus*, 1¼ line.
 - ** Abdomen more or less red; base of hind tibiæ whitish (generally larger than *bicolorinus*). - - - 29. *areator*, 1¼—2½ lines.
 - b. Wings without bands.
 - * Margins of front segments of abdomen reddish in the female; abdomen of male black, or nearly so; legs red; hind femora brown. - - - - - 42. *cingulator*, 1¾—2¾ lines.
 - ** Apex of 1st segment, 2nd and 3rd red, the latter with a brown mark at the sides; orbits of eyes and legs red (female). - - - - - 44. *aberrans*, 1½ line.

We have already remarked on the unsatisfactory state of this genus; as justly observed by Mr. Marshall it appears to be merely "a receptacle for all species (of Cryptides), however dissimilar, which have an imperfect areolet" (Ent. Ann., 1874, p. 123). Gravenhorst described fifty-seven species under this genus in his 'Ichneumonologia Europæa,' but only ten in both sexes; Taschenberg described about the same number, several of which are new, still only fourteen in both sexes; Ratzeburg describes a few more; and, with a few other scattered notices and descriptions, this appears to be all that has been done with the genus. It is one, no doubt, very rich in species as it stands, and much in want of careful revision. Foerster, in his 'Synopsis,' split this genus into seventy-two other elaborate genera, but as he has given no types of these, or described the species included in them, they are but of little assistance, the number of his genera being about equal to the number of described European

species. Marshall's Catalogue includes forty-four species, to which *H. biannulatus*, Gr., has since been added (Ent. Ann., 1874, p. 142). Mr. Parfitt has described three new species from Britain (Ent. Mo. Mag. xviii. pp. 79, 88, 184, 272); and the descriptions of nine other species will be found in Trans. Ent. Soc. Lond., 1883, pp. 142-152. Of these *H. inustus*, Gr., is omitted, as it is almost impossible to identify the species with any certainty from Gravenhorst's short description,—it was not in the Gravenhorstian collection, or Taschenberg would have mentioned it,—which probably refers to the male of some *Pezomachus*. *H. formosus*, Desv., is omitted, as a probable synonym of *H. fragilis*, Gr., the only distinctive character appearing to be the shorter aculeus in the former species. From a long series of captured and bred specimens (from nests of *Agelena brunnea*) this species is seen to be very variable in this and many other respects, and it does not appear improbable that *H. imbecillus* is the male; the females of *H. decipiens*, *gyrini* and *persector* have a marked general resemblance to these two varieties or species. Gravenhorst's *H. melanarius* appears to include the males of both *H. vicinus* and *H. castaneus*. Mr. Parfitt's *H. litoreus* appears to include two distinct species, both males, of which the description is not satisfactory.

Independently of the imperfect areolet the species of *Hemiteles* may generally be distinguished by having the complete metathoracic areæ of *Phygadeuon*, with the slender legs and antennæ of *Cryptus*. There are, however, exceptions to this in *H. crassicornis* and *H. mixtus* having the thickened antennæ of a *Phygadeuon*. Ratzeburg's genus *Hemimachus* was split off from *Hemiteles*, to include those males which have the metathoracic areæ very imperfect or entirely absent; and as they are now well known to be merely the winged males of *Pezomachus*, really the genus has no right to a separate existence. For convenience sake, however, we retain the name in these papers for the known males of *Pezomachus*; so if a male should not be found in the *Hemiteles* tables, it will be advisable to seek it in *Hemimachus*. Much requires clearing up in the economy of this group before the species can be conveniently arranged.

Hemiteles fulvipes is well figured by Ratzeburg (Die. Ichn., i., pl. vii., fig. 6), which is copied with the bad figure of another type into Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 20). *H. melanarius*

is figured by Curtis ('Farm Insects,' woodcut 15, 6); and there is a figure of *H. formosus* (*fragilis*) in Blackwall's 'History of Spiders' (plate xii., figs. B B).

The species of *Hemiteles* appear to be very varied in their parasitism, many seem to be almost polyphagous; compare especially the various hosts from which *H. areator* has been bred. Many species are known to be certainly hyper-parasitic, and Brischke has recorded that the female *H. fulvipes* (= *socialis*, Ratz.) lays its eggs in the *Microgaster* cocoons (Deutsche, Ent. Zeit., xxi. 287). This is not always the case, as the *Argynnis* pupa, from which *H. melanarius* was bred by Mr. Bignell, was filled with eighteen honeycomb-like, thin, brown cocoons of the *Hemiteles*, distinctly showing it to be a direct parasite.

The following table of hosts will be found to include insects of five orders, and several species are commonly parasitic in the egg-bags of spiders.

- | | | |
|----------------------------|------|--|
| 2. furcatus, <i>Tasch.</i> | from | <i>Dianthœcia cucubali</i> ; Bignell. <i>Chrysoclista schrankella</i> , Fitch Coll. <i>Gracillaria phasianipennella</i> ; Threlfall, Fletcher. <i>Laverna epilobiella</i> (? ex <i>Ascogaster</i> cocoon); Fitch. <i>L. decorella</i> ; Marshall. <i>Apanteles</i> cocoons ex <i>Zygæna filipendulæ</i> ; Bignell. |
| 5. imbecillus, <i>Gr.</i> | „ | <i>Fumea intermediella</i> , Brd. (= <i>nitidella</i> , Hof.)*; Siebold. <i>Apanteles glomeratus</i> ex <i>Pieris brassicæ</i> ; Bridgman. <i>Rhodites eglanteriæ</i> ; Taschenberg, Reinhard. |
| 7. necator, <i>Gr.</i> | „ | <i>Limacodes asellus</i> ; Kirchnér's Cat. <i>Penthina cynosbana</i> or <i>Spilonota ocellana</i> ; (Brischke) Ratzeburg. |
| 11. oxyphimus, <i>Gr.</i> | „ | <i>Cymatophora ocularis</i> ; Marshall. <i>Cynips kollari</i> galls; Billups. <i>Anobium</i> infested oak-bark; (Wissmann) Ratz. Dug out of old post, in which were both coleopterous and hymenopterous larvæ; Parfitt. |
| 13. similis, <i>Gr.</i> | „ | <i>Pardia tripunctana</i> ; Giraud. <i>Psyche calvella</i> ; Siebold. <i>Coleophora hemerobiella</i> ; (Goureau) Dours' Cat. <i>Lithocolletis spinicolella</i> ; Elisha. <i>Microgaster</i> ; (Bouché) Ratz. <i>Microgaster</i> ex <i>Lasiocampa pini</i> *; Brischke. <i>Cynips kollari</i> galls; Billups. <i>Epeira diadema</i> ; Gir. Spider's nest; Bridgman. |
| 14. fulvipes, <i>Gr.</i> | „ | various <i>Microgaster</i> cocoons; generally. Hyper-parasitic on <i>Pieris brassicæ</i> , <i>P. napi</i> , <i>Vanessa urticæ</i> ; Brischke. <i>Vanessa atalanta</i> ; Bridgman. <i>Zygæna trifolii</i> , <i>Euchelia jacobææ</i> ; Brischke. <i>Liparis dispar</i> ; Ratz., Gir., |

- Brischke. *Lasiocampa pini**; Ratz., Brischke. *Clostera anastomosis**; Gir. *Diloba cæruleocephala*; Brischke. *Plusia chrysis*; Perkins. *P. gamma*; Brischke. *Apanteles glomeratus*; Marshall, Vollenhoven, Fitch. *A. congestus*; Taschenberg?, Reinhard, Fitch. *A. spurius* ex *Hadena oleracea*; F. Löw. *Selandria pusilla*; Brischke. Spider's eggs; (Brischke) Ratz.
- socialis*, Ratz. „ *Microgaster* ex *Pieris brassicæ*; (Nördlinger Ratz., Boie, Brischke. *Apanteles octonarius* ex *Lithosia quadra*; Ratz.
16. *decipiens*, Gr. „ *Lipara lucens*; Brischke.
17. *formosus*, Desv. „ *Agelena brunnea*; Smith, Bridgman, Bignell. *Emphytus cinctus*; Wilson [? error].
20. *vicinus*, Gr. „ *Pieris brassicæ*; Kawall, Drewsen, Gir., Kaltenbach Coll. *Vanessa calbum*; Holmgren. *Coleophora Giraudi*; Gir.
23. *tristator*, Gr. „ *Pieris brassicæ*; Brischke. *Fumea intermediella**; Siebold. *Solenobia triquetrella*; Hofmann. Eggs of *Epeira diademata*; Brischke.
24. *limbatus*, Gr. „ *Chrysopa* sp.; Brischke.
25. *conformis*, Gr. var. „ Hyperparasitic on *Diloba cæruleocephala*, *Acronycta psi*, *Botys verticalis*; Brischke.
26. *bicolorinus*, Gr. „ *Bombyx quercus*; Tasch. *B. neustria*; Gr. *Fumea intermediella**; Voll. *Seythropia cratægella*; *Coleophora anatipennella*; Tasch. *Microgaster* ex *Liparis dispar*; Gir. *Cynips kollari* galls; Billups.
28. *æstivalis*, Gr. „ *Chrysopa perla*; Gir. *Chrysopa* sp.; Brischke. *Microgaster* ex *Chrysopa perla*; Ratz.
- var. *modestus*, Gr. „ *Heliodines Roesella*; Heeger. *Anobium domesticum*; (Wissmann) Ratz. *Pissodes notatus*; (Reissig) Ratz. *Scolytus destructor*; (Radzay) Ratz.
29. *areator*, Panz. „ *Orgyia pudibunda*; (Nördlinger) Ratz. *Lasiocampa pini**; Ratz. *Dicranura furcula*; Tasch. *Tortrix viridana*; Ratz. Tortricid; Brischke. *Psyche calvella*, *Fumea intermediella**; Siebold. *F. affinis*; Hofmann. *Psyche* sp.?; Ratz. *Talæporia pseudobombycella*; Carrington, Fitch. *Cerostoma costella*; Voll. *Hyponomeuta padella*; (Brischke) Ratz. *H. malinella**; Brischke. *H. evonymella* (cognatella); Ratz. *Gelechia albipalpella*; Marshall. *G. vulgella*; Elisha. *Coleophora currucipennella*; (Goureaux) Dours. Cat. *C. nigricella*; Gir. *C. anatipennella*, *C. therinella*; Marshall. *Lithocolletis* sp.; Brischke. *Trichiosoma betulæ*, *Lophyrus pini* or similis; Ratz., Brischke. *Fenusa*

- pumilia; Brischke. *Cryptus incubitor* [cim-bicis] ex *Trichiosoma betulæ*; Voll., Bridgman, Bignell. *Phygadeuon basizonus* ex *Lophyrus pini*; Ratz. *Macrocentrus thoracicus* ex *Phycis betulella*; Fitch. *Microgaster* ex *Lasiocampa pini*; Ratz. *Microgaster* ex *Pieris brassicæ*; Gir. *Cynips kollari* galls; Weston. *Andricus terminalis* galls; Walker. *Hedobia imperialis* and other xylophagous oak-feeders; (Nördlinger) Ratz. *Anthrenus* sp.; Westwood. *Cecidomyia rosaria*, *Chrysopa* sp.; Brischke.
30. *melanarius*, *Gr.* „ *Pieris brassicæ*; Drewsen, Tasch. *P. napi*; Curt. *Argynnis paphia*; Bignell. *Vanessa c-album*; Holmgren. *Psyche* sp.; (v. Siebold) Ratz. *Solenobia triquetrella*; Siebold. *Pissodes notatus*, *Hylurgus piniperda*; (Reissig) Ratz. Spider's eggs [female of *Pez. agilis*]; (Goureau) Dours' Cat.
33. *castaneus*, *Tasch.* „ [? *Exæretia allisella*; Sang]. *Trichiosoma betulæ*; Bignell. *Clavellaria amerinæ*; Brischke. *Lophyrus pini* or *similis*, *Chrysopa* sp.; Brischke.
36. *fragilis*, *Gr.* „ *Emphytus cinctus*; Wilson. Spider's nests; Brischke.
37. *monozonius*, *Gr.* „ *Perilitus unicolor*; Hartig.
39. *tenerrinus*, *Gr.* „ *Microgaster* cocoons; Parfitt. *Agelena brunnea* nests; (Goureau) Gir.
42. *cingulator*, *Gr.* „ *Hyperparasitic* on *Cucullia argentea**; Brischke. *Tinea biselliella*; Boie. *Coleophora nigricella*; (De Graaf) Voll. *Chrysocorys festaliella*; Barrett.
- palpator*, *Gr.* „ *Pieris brassicæ*; Tasch. *Scoparia cratægella*; (Snellen) Voll. *Fumea intermediella**; Voll. *Clavellaria amerinæ*; Brischke. Cylindrical black and white spotted cocoon [? *Limneria* sp.]; Tasch. Egg-bag of spider; Reinhard, Dours.
- gyrini*, *Parfitt* „ *Gyrinus natator*; Parfitt, Hellins, Bignell.

BRITISH *VERSUS* EUROPEAN LEPIDOPTERA.

BY PRIORS MARSTON.

A PAPER which appeared in 'Land and Water' for March 10th, entitled "British *versus* European Lepidoptera — what is a British Subject?" by M. A. Wailly, calls, I think, for some notice from British entomologists. It is surprising that this paper did not appear in one or other of the periodicals especially

devoted to the subject of Entomology, unless, indeed, it appeared in 'Land and Water' only after being rejected by these magazines. That it may have been so rejected seems likely enough, for a more illogical paper I have rarely read, displaying both an ignorance of British Lepidoptera and of English literature on the subject which is simply depressing. M. Wailly may "already see a simile," as he anticipated; but it is at no cracking "of one of his jokes," but rather in pity. M. Wailly informs us that, besides exotic Lepidoptera, "I also rear European species whenever I receive ova or pupæ of such that I do not know, and I know but few of them." This is a reasonable thirst for knowledge. But he tells us that "on October 27th, 1879, he received 500 ova of *Ennomos autumnaria* (= *alniaria*)"; this strikes one as an enormous number for one person to receive, if it is only a reasonable thirst for knowledge he desires to slake—a dozen eggs would suffice. "The ova hatched from May 10th, 1880, but I kept no notes on the rearing of the larvæ, which were of little interest to me." Then there was not much thirst after all; yet why again in 1881 did M. Wailly rear them "for the second time" and obtain "a large quantity of fertile ova"? Surely our philosophic entomologist takes a deal of trouble about a species of "little interest" to him. Having introduced a species which was of extreme rarity here, M. Wailly not only attempts to defend this procedure, but attacks those entomologists who limit their studies to British Lepidoptera. As regards defence, I will remark, "*qui s'excuse s'accuse*"; the attack, however, requires some special notice.

M. Wailly delivers himself of this extraordinary remark:—"He who imports and rears species which he cannot find or obtain in his own country is a creator, as it were; he who ransacks every nook and corner to hunt down rare species is a destroyer"; and he asks, "which of the two renders the greatest service to entomological science?" He continues, "It is unnecessary to state why entomologists who sell pure British species object to the introduction of continental species for an obvious reason." The reason may be obvious enough, but surely not more obvious than M. Wailly's reason for upholding the importation of continental species—and, mind, especially the importation of those species the British examples of which command a high price. I will ask M. Wailly, did he not import

the 500 ova of *E. autumnaria* for sale—quite apart from any desire for knowledge? and why, if not for mere pounds, shillings, and pence, are the importations from abroad almost limited to species which as British are of extreme rarity? When viewed by this light your importer does not figure favourably as one who does a great “service to entomological science.” The man “who ransacks every nook and corner to hunt down” (which does not mean exterminate) “rare species” does render great service to entomological science, by not only discovering species new to the country he may be in, but also species absolutely new to science. This has been done over and over again, even by those British entomologists on whom M. Wailly is so hard. It surely is unnecessary to point out the aid to science which a more or less definite knowledge of the purely British Lepidoptera renders. It never seems to strike M. Wailly that a man can study foreign Lepidoptera and yet keep a collection of purely British specimens. What is protested against—and simply on the score of morality, and quite independent of any entomological love—is, that dealers should import almost entirely foreign specimens—ova, larvæ, pupæ, or imagos—of species which may be fraudulently used. Does M. Wailly think that the demand for his ova of *E. autumnaria* would have been so great if they had been of a species which had never occurred in this country, and which was never likely to do so?

M. Wailly then goes on to discuss, “What is a British subject?” Not, however, it would appear with a view to answer his question, but rather to throw as much doubt as he can upon species some of which, at least, are British. As regards *Vanessa antiopa*, M. Wailly states that, so far as he knows, it has only occurred singly. It may interest him to know that two gentlemen saw a great many one morning flying round poplars near Cambridge; and six or seven or more specimens have been taken by one person, and that on more than one occasion. M. Wailly seems to infer that this species is not able to “be in existence during the winter” here. It may interest him to know that hybernated specimens have been taken in this country. M. Wailly appears to think that *A. atropos* is not “a British subject,” as it appeared two or three years ago so abundantly on the Southern Coast of England, and has not devastated the potato-fields. He asks, “What has become of those thousands of *Atropos* found in Sussex and Kent?” I must confess my

ignorance of the fact—and a fact I suppose it is if M. Wailly states it—that thousands of *Atropos* were so found. Surely M. Wailly does not base an argument adverse to *Atropos* being “a British subject” simply because it is much more numerous in some seasons than in others; if so, we should be poorly off indeed for indigenous species. *Polyommatus phlæas* some few years ago had become so scarce that I heard it hinted that its extinction would follow that of *P. dispar*. *V. polychloros*, after being very common for many years, became very scarce, and is again common. Both *Catocala sponsa* and *C. promissa* for some years prior to 1871 had been very scarce. *Lithosia quadra* larvæ many years ago appeared in countless numbers in the New Forest, with a proportionate number of imagos, yet in 1871 and a few years prior but very few were taken—now they are again common. In 1871 again *Dicycla oo* was exceedingly common, but has been scarce since then; and many other instances might be quoted. Yet few, if any, I think, would doubt that they are as purely indigenous British species as any can well be. M. Wailly refers to *Sphinx convolvuli*, *Deilephila livornica*, *Chærocampa nerii*, and *C. celerio* as other species of the Sphingidæ which cannot be considered British. *S. convolvuli* larvæ have year after year been found by an entomologist, feeding on bindweed in an old gravel-pit. *D. livornica*, I am informed, can be taken regularly on the South Devon Coast. *C. nerii* is but an occasional visitor. *C. celerio* may be so also, but larvæ of it have been found in this country. Will M. Wailly name the “several species of the finest British Lepidoptera” which have entirely disappeared, and those “others which at no very distant period may also become extinct”?

I will not specially notice M. Wailly's quotations from W. J. Coleman's book on British butterflies, as the book cannot be considered as carrying any weight as a standard work.

M. Wailly states, as regards *Papilio machaon*, that “it is confined within comparatively very narrow limits—the fens of Cambridgeshire; I do not know that it is found anywhere else.” It seems almost incredible that anyone taking an interest at all in British Lepidoptera should reside here for even six months and not know that *P. machaon* has a wide range in the Norfolk fens.

As regards extinction of species of Lepidoptera. Can M. Wailly point to a single species which has become extinct here solely from the efforts to those collectors who ransack every nook and corner for rare species?

It would, I think, have conduced to a fair valuation of M. Wailly's article by the readers of 'Land and Water' if he had let it be at once known that he imported continental species for sale, and not endeavoured to figure solely as the sarcastic philosopher.

Byfield, Northamptonshire.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS DAPLIDICE IN CAMBRIDGESHIRE.—I was very pleased to read, in the 'Entomologist' of February last, of the capture of *Pieris daplidice* by Mr. Baker; and seeing that it was captured near Newmarket, I have thought it would be interesting to some of the Cambridgeshire collectors to know that in 1859 I met with three of this interesting insect, one at Bottisham Rise (about Aug. 11th), the second near the 'Prince Albert,' and the third at Quy Church, on September 12th. At that time I always walked down to Newmarket, and was generally very well repaid for the journey, as I came across many good things; and no doubt if other collectors would work the same district we should hear of more *P. daplidice* being captured. During the same season *Colias edusa* and *C. hyale* were common. On the same road I found four larvæ of *Deilephila galii*. *Chærocampa porcellus* and *C. elpenor* were plentiful, and many other things that occur on chalky districts, and now and then some of the fen insects put in an appearance. As the distance is very short, I have no doubt it would pay some of our young entomologists to stay a few days at Bottisham, as they might spend one day at Newmarket Ditch and the next in the Fen, thus varying their collecting. Possibly Reach would be better than Bottisham, as it is only four miles off Wicken and joins Newmarket Ditch.—H. JOBSON; 3, Clarendon Road, Walthamstow.

ARGYNNIS DIA AT EPPING.—About a month ago I saw a fine specimen of the above insect, in the collection of a gentleman living at Shepherd's Bush, which was recently advertised for sale. He informed me that he had taken it at Epping some years ago, and he drew my attention particularly to the under-side. The specimen was in excellent preservation, not at all rubbed, and

smaller than *A. selene*.—P. J. RENDALL; 20, Ladbroke Square, London, W., Feb. 20, 1883.

[We insert the above statement of our correspondent, but decline to give an opinion upon the probability of *A. dia* occurring in Epping Forest, not having seen the specimen.—J. T. C.]

NOTES ON THE REARING OF *CHELONIA PLANTAGINIS*.—Thinking that it may possibly interest some of the readers of the 'Entomologist,' I have ventured to give a brief account of my experience in the rearing of the above mentioned insect, so that if any should have a desire to breed it they may have the benefit of my notes on the subject. In May of last year I obtained a female of *C. plantaginis*, which laid a brood of about three hundred eggs. They all hatched in about twenty days, and I supplied them with their proper food, *viz.*, the narrow-leaf plantain. I kept them on this food for about three weeks, and noticed that during that time about a third of the number made more rapid strides in growth than the others. At the suggestion of Mr. Wellman I now substituted lettuce for the plantain, and placed the breeding-cage in the sun. They all continued to thrive, but the one-third above mentioned grew rapidly and pupated about the last week in August, and emerged, very fine and perfect specimens, during October. The remainder continued feeding until the third week in November, when I placed them in a cold dry cellar. During the winter I supplied them weekly with a small quantity of groundsel, upon which they occasionally fed. On the 24th of January they began to feed freely on groundsel, upon which I kept them until the middle of March, when lettuce becoming again procurable I re-transferred them. Upon this diet they made rapid strides, and finally pupated during the first week in April. I may mention that during the winter I only lost about one-third of the number, and can strongly recommend the use of lettuce, not only as a food-plant for the above-mentioned species, but also for *C. villica*, which I have reared upon it with greater success than upon chickweed, its ordinary food.—M. RICKETTS; Bouverie House, Folkestone, April 20, 1883.

CYMATOPHORA FLAVICORNIS.—I had this winter some pupæ of *C. flavicornis*, and as several of the insects did not emerge I opened a few of the pupæ, and in four of them found that the

head of the moth was towards the tail of the pupa-case; they had split the case in the usual manner, but had been unable to emerge. What is the explanation of this anomaly?—W. R. BUCKELL; Romsey, Hampshire, April 6, 1883.

DASYCAMPA RUBIGINEA NEAR SALISBURY.—I have much pleasure in stating that I took the above insect at sugar, on the 31st of March last. The specimen is very fair for a hybernated one.—H. POWYS GREENWOOD; Harnham Cliff, Salisbury, April 23rd, 1883.

ERASTRIA VENUSTULA.—I observe in Mr. Wright's article, last month (Entom. xvi. 81), that he indicates *Tormentilla reptans* as a food-plant for the above-named species. Although I have frequently searched carefully the leaves, and particularly the yellow blossoms of that plant at the proper time, *viz.*, during July and August, I have failed to find any trace of the larva, neither have I seen any evidence of its feeding. Perhaps your correspondent can inform us authoritatively whether he has ever found the larva of *E. venustula* feeding on the plant named, or may be some of your correspondents who have studied the life-history of this beautiful little Noctua may be able to throw some light upon it; for though it is the food-plant named in most text-books, yet I cannot help thinking that although it may occasionally feed upon it, yet it does not absolutely confine its gastronomical powers to it.—WALTER SCOTT; Colonial Office, S.W., April 24, 1883.

BREPHOS NOTHA IN THE ONGAR PARK WOODS.—As this pretty and interesting species is, I believe, considered rather a "good thing" among entomologists of the London district, it may interest that section of your readers to hear that I have lately taken it in some numbers in the Ongar Park Woods. Its time of appearance in this locality is the first or second week in April, according to the season; but, in any case, it is not seen on the wing until its congener, *B. parthenias*, is almost, if not quite, over. One would infer from our standard authorities that both species were out simultaneously or nearly so; such, however, I have not found to be the case. A sunny day, and a long pole on which to fix one's net, are essential to the capture of *B. notha*, which, so far as my experience goes, is even more fond of keeping up aloft than its cousin *B. parthenias*. With the aid,

however, of a good ash-pole one can get on even terms with them, as they are easy enough to capture when within reach. They frequently alight on the topmost sprays of the underwood, and folding their wings when at rest, are in that position almost invisible. I found it a good plan to walk along the wood ridings, tapping the highest branches within reach; they fly at once, when disturbed, and can then be seen and perhaps caught. The female seems much rarer than the male; probably, however, this is owing to their more sluggish habits. After the series of diminutive bred specimens one sees so commonly in collections, I was surprised at the size of the species when fed in the open. Mr. English, of Epping, informs me that years ago he took the insect in the same locality in plenty, but it gradually became scarcer, and he had not observed it at all of late years. I was therefore all the more pleased at "turning it up" again.—HAROLD CONQUEST; Chingford, April 23, 1883.

MIXODIA RUBIGINOSANA, AND OTHER LOCAL MICRO-LEPIDOPTERA IN NORFOLK DURING 1882.—On the 16th of June last year, amongst other insects my brother brought home from a day's collecting were five specimens of *Mixodia rubiginosana*. They were taken in extensive fir-woods, about seven miles from King's Lynn. The species being so decidedly northern, and therefore one unlooked for in this county, I have instituted enquiries as to the source from whence the Scotch fir-trees of these woods were obtained, and find that they were brought from Scotland some twenty or thirty years ago; therefore it would appear that the species was introduced with the trees. In the same woods and on the same day, two fine specimens of *Cryptoblabes bistrigella*, were captured; and on very wet ground, among reeds, about half a mile from the woods, a single *Cosmopteryx lienigiella* was boxed. During the next month (July), whilst collecting *Strathmopoda pedella*, by beating some old alders, four splendid specimens of the brilliant little *Bohemannia quadrimaculella* were dislodged and secured. Earlier in the season (May) *Tinagma resplendella* also occurred in this district. In conclusion, let me add, that not being sure that I had correctly identified some of these species, they were sent to Mr. C. G. Barrett, who has kindly named them for me.—EDWARD A. ATMORE; 8, Union Street, King's Lynn, Norfolk, April 19, 1883.

SOLENOBIA INCONSPICUELLA AT CLAPHAM.—On the 31st March I took a male of this species from some palings on Clapham Common. A careful search on the trunks of some old elms produced the cases in considerable abundance, a few slowly crawling upwards with their burden; the majority, however, had become fixtures; there were also empty cases of this and the last season.—GEORGE COVERDALE; 24, Fleming Road, Lorrimore Square, S.E., April 2, 1883.

SPRING NOTES AND HINTS ON BREEDING.—The prospect of an early season has been completely changed by the cold weather which commenced in the first week in March. The unusually mild December, January, and February had brought out several of our spring Lepidoptera, notably *Endromis versicolor*, three very fine males having emerged in my breeding-cages during February, fully a month before their usual time, and this with the cages out of doors. The extremely cold weather of March, however, entirely stopped emergence, and a male and female moth hung in an almost lifeless condition for three weeks, without once changing their position until the 31st of the month. A mild change occurring they commenced to move sluggishly, but appeared too weak to copulate; so were killed. The warmer weather that prevailed during the early part of this month soon showed its effect on pupæ. On the 1st of the month a beautiful female *Petasia nubeculosa* emerged, followed by a second the next day; and to this date, April 17th, six males and seven very grand females of *E. versicolor*. These were all from two-years' old pupæ, and both species I obtained from Mr. McArthur, from Rannoch, in 1881. From thirty-three fertile eggs of *E. versicolor* I have now bred twenty-one moths, eight in 1882, of which seven were males and one female, and thirteen up to date this spring—six males and seven females. From seven fertile eggs of *P. nubeculosa*, one male, bred 1882, and two females this month; and I quite hope to see others from the four remaining pupæ next season. *P. nubeculosa* has the credit of being difficult to breed, so that I congratulate myself on my success with this rare species. I may remark, *en passant*, that the description of the larva, as given in Newman's 'British Moths,' is evidently described from life, and is very correct. I compared it with the larva when full fed, and it agreed perfectly. From the one female *E. versicolor*, bred

last year, I obtained a batch of eggs, most of which I distributed to various friends, keeping twenty myself. These fed up well until nearly full fed, when they were attacked with diarrhœa, so fatal to larva; the frass became moist, and their beautiful green colour soiled and dirty; they were evidently very sick, and I quite expected to lose them all, so thought I would try a strong remedy to save them. Each larva was held under a tap of cold water, and gently brushed with a camel-hair pencil, so as to thoroughly cleanse them, and then rinsed in the stream of dripping water; they were then placed on clean, dry food; and the result was a perfect success. Every larva fully recovered, fed up well, and went to healthy pupæ, some of which I have bred this month, but most will probably lie over till next season. This cold douche bath is evidently worth trying for larvæ attacked with diarrhœa. I had once before successfully used it in a milder form, *i. e.*, simply brushing the larva with cold water, on a small brood of *Chesias obliquaria*: the moistened frass in their case had dried on the anal flap, and so completely blocked all outlet; but cleaning was a perfect cure, and I bred every one, although five laggards remained two years in pupa. At any rate I can confidently recommend the douche bath for affected larvæ.—W. H. TUGWELL; Greenwich, April 17, 1883.

SALLOWS AT LOUGHTON.—Having read the able article on “Sallows” by the Editor of the ‘Entomologist’ (Entom. xvi. 85), I thought, as I had never before worked them, I would go and see what success awaited me. Selecting a fine evening, *viz.*, April 9th, and provided with beating-tray and lamps, I started off to Loughton, hoping to meet again my old friends of last year, *viz.*, the Noctuæ. The spot which I selected was a slope with southern aspect, well wooded with oak and a good sprinkling of willow. I waited impatiently for the last rays of the setting sun, anxious to verify Mr. Carrington’s article above mentioned. I had always been under the impression that an easterly wind was unfavourable for collecting, and was much surprised to find, that although one was blowing at the time, the moths were flying gaily against it. I was pleased to observe *Hybernia progemma*, *Anticlea badiata*, *Larentia multistrigaria*, *Tortricodis hyemana*, and *Diurnea fagella*, although not in large numbers. But it was for the Noctuæ I had principally come, and darkness had hardly

set in when I opened my tray, and placing it under a fine male plant gave it a sharp rap, and looking anxiously for results was pleased to find *Tæniocampa munda*, *T. instabilis*, and a number of *Cerastis vaccinii* and *Scopelosoma satellitia*, the two latter looking rather the worse for their long sleep. Another beat brought me a similar lot, with the addition of *T. stabilis*; and in subsequent beats I obtained *T. gothica*, *T. gracilis*, *T. cruda*, and *Xylocampa lithoriza*. These made up the sum total of my first evening at "sallowing," which I hope will not be the last, as I have no hesitation in stating that it was one of the most pleasant evenings which I have as yet spent, notwithstanding the numerous sallies of the friend who accompanied me, about the absence of *Dasycampa rubiginea*. I trust next year to be able to testify that the sallows are as tempting to the other good things mentioned by Mr. Carrington, as they were to those insects which I have enumerated. I may mention that I have just bred a nice series of *Melanippe hastata* from ova obtained last season.—H. JOBSON, jun.; 3, Clarendon Road, Walthamstow, April 20, 1883.

COLLECTING IN NATAL.—The number of species of Natal butterflies taken by me now amounts to the respectable number of 203; and this for the rather limited Rhopalocerous fauna that South Africa offers is a rather large proportion. This number includes (with two or three exceptions) all the coast butterflies known. Up country I have done but little collecting; the climate there, from its elevation, becomes much colder, and the tropical species entirely disappear. At Maritzburg, 60 miles inland, I have done a little collecting, my best capture being *Durbania amakosa*, which I met with on the Town Bush Hill flying over the bare rock. On Feb. 10th, 1883, business took me to Durban, and in the afternoon I strolled into the woods above the town for an hour's collecting. Here for the first time I saw the singularly marked *Aterica meleagris* alive; but the specimen was so active that it entirely eluded pursuit. The next day (Feb. 11th) the thermometer stood at 109° in the shade, being far too hot to swelter in an ill-ventilated church listening to a drowsy sermon from a sixth-rate preacher, so I went for a quiet stroll through the Verulam Cemetery. Whilst watching the gambols of the Varanes butterflies, who were merrily chasing each other through and around the cypress trees, suddenly a dark-looking insect

came with a jerk and settled on a dead cypress branch close beside me. I at once recognised it by its "snout" to be *Libythea labdaca*, an insect I had assiduously sought after for four years past. It obligingly waited whilst I drew a little net from my pocket and adjusted it, and upon taking the prize I found I had secured a lovely perfect female. How many score of *Crenis Natalensis* and *boisduvalii* have I netted during the past four years in the vain hope that this species would be amongst them! I am the more proud of my capture since it is the only specimen taken in Natal since 1878, in which year half-a-dozen individuals were secured. The wooded district in the neighbourhood of Verulam is stunted, and not higher than the under-growth of an average English copse; but there is one place where the trees are high, and form a natural avenue. This is a favourite spot for certain high-flying butterflies, especially *Papilio leonidas*, *Diadema Misippus*, *Anthedon*, and *Dubea*, *Charaxes brutus*, *saturnus*, and *cethæron*. Last Saturday (Feb. 17th) I was in this avenue, and whilst watching these butterflies as they circled and coquetted in merry groups, now chasing each other through the sunlit branches and anon resting on some dead and dry twig, I noticed among a group of the genus *Diadema* a fine specimen that was new to me. Having a long-handled net I at once secured it, and found my prize to be a splendid female expanding over four inches, and of a species distinct from *Anthedon*, *Mima* or *Missipus*. Considerably exercised in my mind, I returned home, and after luncheon returned again to the avenue, where fortune again awaited me, for I captured a male specimen of the same species as I had secured in the morning. What it is I am not prepared to say, but on my return I intend to have my enormous collection of Lepidoptera and Coleoptera thoroughly overhauled, and the new species made known to Science.—A. J. SPILLER; Verulam, Natal, Feb. 19, 1883.

EMUS HIRTUS NEAR REDRUTH.—I took a specimen of the above insect near Lizard Point, in the autumn of 1881, but was not sure of its identity. However, having to go to London this winter I took it up with me, and at the British Museum they assured me it was a true specimen of *E. hirtus* and a great rarity.—A. HAMILTON JENKIN; Trewirgie, Redruth, Cornwall, April 17, 1883.

CERATAPHIS LATANIÆ, *Boisduval*, ON LEAVES OF ORCHIDS AT CHICHESTER.—On February 14th Mr. Gatehouse, of this town, sent me some plant-lice, which he found infesting the leaves of orchids in his Conservatory. These I forwarded to M. Richter, of Montpellier, for identification. He informs me that they are the *Cerataphis lataniæ* of Boisduval. He has furnished me with three microscopical preparations of those transmitted, viz., the mother larva, *Pseudogyna fundatrix*; the agamous form, *P. gemmans*; and the larva of *P. migrans*; and has most generously presented me with the winged emigrant, *Pseudogyna migrans*. As Buckton does not mention this insect in his 'British Aphides,' published by the Ray Society, this record of its discovery may prove acceptable to those interested in the subject. I shall, all being well, keep a strict watch for the winged emigrant in May, and for the still rarer pupiferous form in August. I may add that I have sent specimens to Mr. Enoch, so well known for his exquisite preparations of insects without pressure, to be preserved in this manner, in order that the beautiful pearly-white fringe of the adult may be seen to the best advantage in contrast with the brown colour of the body.—JOSEPH ANDERSON, JUN.; Chichester.

OBITUARY.

PHILIP CHRISTOLPH ZELLER.—Lepidopterists will read with sorrow of the death of this well-known Entomologist, whose name during the last generation has been a household word among the readers of this magazine. He has long been the authority to whom many Englishmen have referred in matters of difficulty, especially in reference to Micro-lepidoptera. Professor Zeller was born on the 9th April, 1808, at Steinheim, and died at Grünhof, near Stettin, 27th March, 1883, unexpectedly, of heart disease. Among other literary work the subject of this memoir is best known to our readers as a joint editor with Mr. Stainton in the 'Natural History of the Tineina,' which unfortunately has ceased latterly to appear; and we fear through Prof. Zeller's death the chances of the continuance of that really classical work are almost extinguished.—J. T. C.

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ABNORMAL LARVA OF *MELANIPPE MONTANATA*.



Abnormal larva of *Melanippe montanata*.

THE curious larva of *Melanippe montanata* figured above was exhibited by me at the Entomological réunion at the Royal Aquarium, on March 5th last. It has the antennæ and prolegs of the perfect insect fully developed. This monstrosity was one of a brood of a dozen larvæ which I reared from ova. These eggs hatched in August, 1882, and I noticed nothing particular about the young larvæ until the end of November, when I observed that one was considerably larger, and was evidently more forward and thriving than the others. I watched it carefully, and found it almost continuously feeding, and keeping steadily to its food (*Primula vulgaris*), with which the larvæ were liberally supplied during the past mild winter. On February 15th I was astonished to find that this forward individual had developed the antennæ of the imago, but without in any other way altering its larval appearance. For a space of two or three days the antennæ were beautifully pectinated, and then the prolegs of the imago became perfect, being, with the abnormal antennæ, of the appearance of uncoloured gelatine. Both antennæ and legs then gradually shrank and dried until the 20th; and as the larva showed signs of dying I thought it better to preserve it while possible. All the larvæ in this brood were reared in a cold room, with the windows generally open.

E. H. JONES.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. KIRBY.

(Assistant in the Zoological Department, British Museum.)

No. XIX. NYMPHALIDÆ—NYMPHALINÆ (*concluded*).

THE East Indian genus *Euthalia* is very extensive, and includes species of considerable size (from 2 to 5 inches in expanse). They are generally brown or olive-green above, with paler markings, several species being banded with greenish white or buff, in the same manner as *Limenitis*. They are, however, much more robust insects, and the hind margin is more or less concave. Many are banded with white on the fore wings only, while others are marked with blood-red spots. *A. durga*, one of the largest and handsomest species, exceeds 4 inches in expanse. The wings are dull green, with a broad white band divided into oblong spots by the nervures, extending across the fore wings to the middle of the hind wings. From the middle of the fore wings to the anal angle of the hind wings runs an irregular blue suffused band outside the white one.

In the beautiful East Indian genus *Symphædra* the males are deep black, broadly bordered with a shaded blue or green band; and we find a similar arrangement of colour in the males of some of the smaller species of *Euthalia*. The females of *Symphædra* are larger than the males, and are marked with several rows of white or buff spots. *Symphædra nais*, the smallest species of the genus, is, however, differently coloured. It expands nearly 2 inches across the wings, which are of a pale red, with some rather large blackish spots on the fore wings, and a submarginal row of smaller ones.

The genus *Apatura* is too well known to detain us long. It is found in most parts of the world; and although several of the Indian and South American species are very inferior to our own *A. iris* in size and colour, yet others are suffused with much brighter blue or green. The under surface of some of the South American species is of a most brilliant silvery white.

A much commoner genus in South America, however, is *Prepona*. These are large, black, robust butterflies, 4 inches in expanse, with a broad blue band across both wings.

Another remarkable South American genus is *Aganisthos*.

A. odius is fully as large as *Prepona* in expanse, but the wings are narrower, and the fore wings are very deeply concave below the tip. It is black, with the basal third, and the whole middle of the fore wings, fulvous.

Agrias and *Smyrna* are two other handsome South American genera, allied to *Prepona*, &c., but smaller, rarely exceeding 3 inches in expanse. They are, however, stout-bodied insects, capable of powerful flight. The hind margin of the fore wings is only slightly concave; but the anal angle of the hind wings in *Smyrna* is sometimes slightly lobed. The species of *Smyrna* are of a rich tawny or fulvous, with the apex of the fore wings broadly black, and marked with three white or tawny spots.

Agrias is one of the most beautiful genera of butterflies, being of a rich black, banded or suffused with large masses of scarlet, orange-yellow, rich purple, blue, or bluish green.

The genus *Charaxes* is well represented in Asia and Africa. There is a single species (*C. jasius*) found in all the countries bordering on the Mediterranean, which is the most tropical-looking of all our European butterflies. They are large insects, usually measuring 3 or 4 inches in expanse, and are often provided with one, two, or three tails in the hind wings. Some are of a rich tawny or fulvous above, and either brown, or beautifully tessellated with red, black, white, and yellow below; others are black, with a broad yellow or whitish band across both wings; others again are black, with blue markings; and some of the largest Indian species are of a pale creamy yellow, with black borders; one of the smallest West African species (*C. eupale*) is of a very delicate green, with the borders rather darker.

The nearest ally of *Charaxes* in South America is *Megistanis*. Two handsome black species, banded above with blue or orange, and spotted with white towards the tip of the fore wings, are not uncommon. The under surface is beautifully tessellated with black on a bluish white ground, and the wings expand over 3 inches.

The genus *Anæa* includes much smaller species, averaging 2 inches in expanse, and with a short, sometimes spatulate tail on the hind wings. They are very numerous in Tropical America, and are of a brown or black colour, more or less of the surface of the wings being filled up with red or blue. *A. nessus*, Linn., one of the largest species, may also be considered the most beautiful,

the fore wings being marked with two oblique pink stripes shading into magenta, separated and bordered below by suffused stripes of the richest blue.

The species of *Hypna* are also common Tropical American insects. They are brown, with a broad cream-coloured band on the fore wings, and the hind wings are frequently dull red in the middle. The fore wings are often pointed, the hind wings have a short spatulate tail, and both are adorned with numerous yellowish spots of a metallic lustre.

Protopogonius, the last genus of the *Nymphaliniæ*, contains brown and tawny species, resembling *Heliconii* in size, colour, and markings, but with broader wings. The front half of the fore wings is produced, the lower prominence almost forming a hook, and the hind wings have a short spatulate tail.

REPORT ON THE ENTOMOLOGY OF CERTAIN DISTRICTS IN ULSTER.

THIS report was contained in a paper read before the Royal Irish Academy, on the 26th February last, by Mr. W. F. De V. Kane, M.A.

News from Ireland latterly has been of such a melancholy character that it is pleasing to find that there are people who in the midst of political misery find time and opportunity to investigate the natural history of that country. Mr. Kane has brought up to the time of reading his paper so much as is known about the Lepidoptera of the eastern portion of the island, not only by investigating and collating the literature of the subject, but also by collecting in several localities which appear to have been hitherto unworked.

In noticing this record of Mr. Kane's, we think it désirable to quote somewhat liberally from it, making such remarks as may here and there seem advisable.

After remarking upon certain papers by our esteemed friends Mr. Edwin Birchall and Dr. Buchanan White, the author goes on to remark upon the limited area over which the lepidopterist has carried on his investigations. These, as Mr. Kane states, have been confined to limited districts in the counties of Dublin, Wicklow, Kerry, Westmeath, Galway, and Mayo; to these he

might have added Sligo, where our correspondent Mr. Percy Russ has unobtrusively worked for the past few seasons, and from which he has sent many curious and interesting forms of insects, generally common to our islands. The author of the paper then proceeds to say very truly that "the long reaches of sandhills and rocky shores around our coasts, luxuriant with every sort of maritime plant, and exposed to various aspects and climatic conditions, have for the most part yet to be explored. Our vast bogs and numerous lake and river margins have, strange to say, contributed a more meagre list than any one of the English fen districts." No doubt the writer is correct in his statement as to the paucity of species as yet recorded from Ireland. This may be attributed to two causes—first, that the country has been very inefficiently worked; and secondly, on account of the geographical position of the island in regard to the European continent. Lying as it does to the extreme west of the main continent, separated by the broad channel, having a humid and somewhat sunless climate, with prevalence of westerly winds blowing from the ocean, it is quite to be expected that there would exist a marked difference between the fauna of the main land of the continent, or even the adjoining islands of Great Britain. Little assistance could be expected from the blow-over theory, as such winds as could carry lepidopterous insects from the main land to Ireland would be chiefly from the east, and when strong enough would be unfavourable to the rapid flight of insects on account of the generally low temperature prevailing when these winds are prevalent.

We should not look so much to the number of species of Lepidoptera which occur in Ireland, as to the variation in colour or habits which may be observed in those taken on account of their insular habitat, and the climatic influences surrounding the locality. From a scientific point of view it is of very much more value to observe the variation of different specimens which may lead to the key to the origin of species, and no better opportunity occurs for investigation of the subject than to the workers in Entomology in Ireland. It would be most advisable to have a series for comparison of even the commonest species taken in various parts of the island, especially from the boggy portions of the centre, and the mountainous districts of the west and north-west. The great low-lying tract of land known as the Bog of

Allan should receive especial attention, inhospitable even as it is.

Mr. Kane remarks:—"The woodlands of Killarney and Powerscourt have yielded surprising results to Mr. Birchall and others; we may therefore reasonably hope for numerous fresh discoveries in like districts elsewhere in Ireland." This is a very reasonable remark, when we can enumerate on the fingers of our two hands the names of those entomologists who have seriously worked the Irish localities. The writer of the report says:—"It seems regrettable that no society exists in this university city (Dublin) which would gather together lovers of Natural History who could record their researches, and through its members diffuse throughout the country an interest in these humanising studies." It does indeed seem extraordinary that the educated people of such a large city should take so little interest in the study of Nature, when few cities possess such facilities as Dublin enjoys. Half an hour's walk from any part of the city places the student at once in the midst of some of the finest collecting grounds in the United Kingdom; while half an hour's railway ride from the city in several directions gives the entomologist choice of some of the most varied geological formations, and consequent varied flora, and hence variety in insect-life. Taking for instance Howth, with its limestone formations and the adjoining sandhills, at Sutton and Malahide. Again, the Kingstown line takes us to the entirely different formation of Bray Head, which is of granite. A trip on the South Western Railway shortly places us in the centre of collecting grounds, to all appearance as suitable to the desires of an entomologist as the fens of Norfolk and Cambridge.

The writer of the report goes on to discuss the result of mild or severe winters upon the development of insect-life; but as his views have recently appeared in these pages, we need not further refer to them. He then proceeds to deal with some of the localities in which he has collected, referring specially to Favour Royal, the seat of the Rev. J. J. Moubay, on the border of Co. Tyrone, which he describes as a stretch of woodland of some 220 acres, with a tract of 180 acres of wild land sparsely timbered with oak, birch, and alder, and now used as a deer forest. Further describing them he says:—"These thickets, invested with the glamour of a hoar antiquity, are supposed still to be

the haunt of the 'Loghrie-man' or 'Leprechaun,' whose wizened face peering out from a mossy stump is said sometimes to startle the lonely scallop cutter as he bends to his task in the gloom of the wood; and also of an unseen sprite, whose attendant footfall, stirring the dead leaves in the autumn gloaming, is wont to mock his homeward steps." Unfortunately Mr. Kane does not record the capture of these "ghosts," probably because his "nocturnal rambles were generally superintended by two stalwart members of the Royal Irish Constabulary." From this district the writer of the record states that he got a large variety of species, and some in great numbers; although in reading over the list one does not observe anything which one might not expect to find in the locality described.

Appended to the report is a long list of Lepidoptera, with remarks added to the names in some instances. These are of more or less value, but tend to show that the writer is earnestly, though somewhat single-handedly, attempting to unravel the secrets of Nature in a little-worked neighbourhood. We must certainly congratulate him upon his efforts, which only want the ripening influence of further experience to make them of real value from a scientific point of view.

JOHN T. CARRINGTON.

Royal Aquarium, Westminster, S.W., May, 1883.

ENTOMOLOGICAL REMINISCENCES.

BY AN OCTOGENARIAN.

[THE following pages are compiled from some rough notes supplied by that well-known collector Mr. H. J. Harding, now upwards of eighty years of age, who—although vigorous and strong in mind, and for his age in physique also—is, we regret to say, sadly crippled in means. We are indebted to our correspondent Mr. Sydney Webb for obtaining the material from Harding. The notes themselves are somewhat disjointed, but the following is the substance of them. He himself entitled them, "Recollections of Entomology and Entomologists sixty years ago."]

My first introduction to Entomology took place when I was about fifteen years old. I was taken to see a collection, and was

quite pleased with what I saw. An entomologist of the name of Sluse, who was clever at drawing and painting, induced my father to cultivate a taste for collecting, but he confined his efforts to the garden, consequently his knowledge never extended much further than "tortoiseshells," "peacocks," and "aldermen," as he called them. I often assisted him in taking those species common in cottage gardens. Soon after I became acquainted with a man of the name of Weatherhead, from whom I learned my first lesson, and with him I went to Colney Hatch Wood, where we frequently collected. I also about the same time became acquainted with Daniel Bidder, a coleopterist, who introduced me to the forest in the neighbourhood of Wanstead. I frequently made excursions to that place with other boys, having for our primary object the collection of blackberries, but I always had an eye to such insects as were flying at the time.

Charlton Pits was then a fine place for *Sesia ichneumoniformis*, and I took two dozen one afternoon; they feed on the black knapweed (*Centaurea nigra*). I also went to Birch Wood with young Bidder, and we worked with the net, sugar not then being known. We found a moth very plentiful on the wing, and as we did not know it we only took half a dozen each. We showed old Bidder our captures, and he said, "Why did you not take more,—in fact all you could?" He also said, "You will never get such a chance again." In this he was right, for I did not take *Toxocampa pastinum* again for many years. During these early days I was shown *Papilio machaon*, and all my thoughts were to get some. I was told that the nearest place at which they were procurable was Whittlesea Mere, and I started one Saturday afternoon with a great box. When I got about ten miles from home in the East of London, I began to enquire if I was right for Whittlesea Mere, and was surprised to find that no one could tell me; and it was not until I overtook a waggoner that I learned that it was somewhere in the Isle of Ely. I rode in his waggon all night, and in the morning he called me and said that he must turn off to Cambridge, and that I must keep straight on; and it was afternoon when I reached Whittlesea. Great was my surprise to find it a village; and as I could find no "swallow-tails" there, I began to enquire if any butterfly-catchers ever visited there. They said that there was one some time ago, but could not inform me where he lodged, and, what was still more discom-

forting, they could not tell me where I could find a bed. However, I was fortunate enough to find one at the Ferry House, about two miles over the marshes, and felt very thankful after my long journey. The next morning I enquired of the children if they knew what a swallow-tail butterfly was, and I heard with joy that they not only knew it, but that there were lots about there. "All right," I thought, "this is the place for me." "There goes one on the other side of the river," cried one, and I was soon across the river. "Where is it?" I cried. "There," said they, and it was with feelings of great disappointment that I beheld only a "tortoisehell." No *P. machaon* did I see that day, but at dusk I took several things, among which were two *Nonagrias*. Not bad things, and if I had known what they were I should have taken more. When the man of the house came home he told me that he could tell me where the butterfly men stopped, and he would direct me in the morning. After breakfast he told me that I was to go to a place called Home, then across the seven fields to Yexley. Off I went in good spirits, and got there by noon, and found the house, and enquired if any fly-catchers stopped there. Oh, yes! Mr. Chant and Mr. Bentley had stayed there! "All right," thinks I to myself, and after dinner I went out and was overjoyed to see *P. machaon* flying gaily over the reeds, but I could not catch them, as they were out of my reach. However, the next day I had them in a turnip-field, and it was a splendid sight to see them flitting over the turnip-blossom. I stayed there a fortnight, and then walked home, nearly eighty miles, well content with my captures.

Perhaps it may interest some to know how the locality for *Polyommatus hippothoe* was discovered, and how that butterfly came to be exterminated. About forty years ago Mr. Benjamin Standish (the grandfather) heard that *dispar*, as then called, had been seen in the Fens. *Dispar* was known and figured in 1792 and 1795. He got a painting of the butterfly, coloured by his father, and went down to the Fens and showed it to people there, but no one knew anything about it. Mr. Drake, at the 'Checkers,' told him that a man lodged there who worked in the Fens, cutting reeds, who was a most likely person to know. When the man returned from work Standish showed him the drawing, and said, "Do you know anything about a butterfly like this?" "Yes," said the man; "I saw some to-day." "Well," said Standish,

"what shall I give you to take me to the spot?" "No!" said the man, "I intend to take a lot up to London." Standish then offered him five shillings to take him to the place, but the man would not divulge the locality, even for a promise of two shillings for each insect captured. The landlord, however, told Standish where the man worked, and he was successful in finding the place, and took a fine lot of *P. hippothoe*. It soon got wind among the folks at the Fen that they were worth two shillings each in London, and two men came from Cambridge and secured a large quantity, which they took to London in boxes full, and sold them at sixpence each. I went down about three years after, and got some of the larvæ. They appeared to be very local, and most numerous where their food-plant—viz. the water-dock—was most abundant. The larva was collected by all persons, young and old. I bought two dozen larvæ of an old woman for ninepence, from which I bred some fine specimens, and sold them at one shilling each. I wish I had them now. Mr. Cole, at Holme Fen, took a large quantity of them. His back-yard was close to their locality. The last time I was there Mr. Cole said he had not seen one for some years. There was the food-plant in plenty on the same spot, but no larvæ. They had been too closely hunted for. However, I solaced myself by taking *Nonagria ulvæ* in Cole's stack-yard. As soon as it got dark they came out of the cut reeds and had a fly. They ran up the inside of the reeds like mice, but how they turned round to get back I cannot make out. I took some nice varieties.

In 1847-8 Mr. Doubleday was down in the Fens, and found *Zeuzera arundinis* in the dykes. He told a man he employed, who lived there, to look after them. He did so, and found the pupæ. I went down the next year, and found the imago. An account of them I published in the 'Zoologist' for 1850, as stated in the first volume of the 'Entomologist's Annual,' and that is the only account I have seen. About this time sugaring was discovered by Mr. Doubleday, who, in his vocation as a grocer, noticed that the moths swarmed round his sugar hogsheads in the back yard. There was a great desire among working entomologists to know how it was made, but the secret was retained by a few. All kinds of scents were tried, but were not found of much use. A man of the name of Courtney made some up, and sold it at one shilling and sixpence per pint. This discovery caused many rare things to become common. *Acronycta ligustri* was a rare moth, and

I have seen fourteen shillings refused for it, and that was even a wasted one. But sugar found them in plenty, and I am of opinion that there are few things really rare. You have only to find out their habits and food-plant. Look at *Aleucis pictaria*, only one taken in fourteen years, yet they existed in plenty on the bloom of blackthorn. Although a man searched Dartford Heath fence a fortnight without success, a few yards from him they swarmed at blackthorn. Since then they have been found in many places.

In the year 1847 Mr. Hindley and myself made up our minds to go to Dover and collect. We started in the steamboat to Margate, and walked to Deal. The wind was blowing very hard, and we had a difficulty in landing. But we arrived at Deal safely. The next morning it poured with rain, but we walked to Dover through it. When it cleared somewhat, we made up our minds to return, thinking that little could be done if we continued our proposed expedition. In walking across the sandhills, making for Sandwich, we took from the stems of grass two specimens of a *Lithosia*. This was in broad daylight. These I showed to Mr. Doubleday some days after, and he pronounced it to be a variety of the common one, but to make sure he sent it to his friend Herrich-Schäffer, who averred that it was *Lithosia pygmaeola*. One of these specimens Mr. Robinson, of Limehouse, had, and one I retained for my own collection.

Some twelve years after I thought I would go to Deal and try to find them again, and I was rewarded by finding them in plenty. I appear to have been the only person who collected on the south coast of Kent for some years. There was a man from Dover, who visited St. Margaret's Bay some years ago, of the name of Leplastre, who was a watch-maker. He seems to have taken *Stigmonota leplastriana*, which was named after him. In one of my rambles I went to St. Margaret's Bay; the weather was hot and thundery, at which time insects leave their retreats and fly. I captured during that evening a *Noctua* which I did not know, as it was much wasted. When Mr. Doubleday saw it he said that it was much wanted, and I promised to go again for it next season. I did so, and took seven the first night on the blossom of the bugloss, and several of *Plusia orichalcea*. The place is now destroyed by the inroads of the sea. In Mr. Stevens' sale a short time ago it was stated in the catalogue,—“*P. orichalcea*, five taken by Mr. Harding at Deal,” and “another lot taken and bred

by Mr. Harding at Deal." The truth is that I never bred one; I took one just out of pupa, which is of a yellow colour. An entomologist at Canterbury has sent out some specimens, which he has stated were taken by me. I have seen them, and they were never taken by me. There appears to be a manufactory at Canterbury for the produce of rare things. I may have taken in all some eighteen or twenty of *P. orichalcea*, seven of which were taken in one night.

During another of my rambles to Deal I procured *galii* larvæ, and I also fell in with a small brown moth in large numbers; that was *Acidalia ochrata*.

One stormy Saturday I was at Darenth Wood. At dusk I took seven *Xylomiges conspicillaris*, one of which laid several eggs; but what to feed the young larvæ on I did not know. In a book it said, "feed on vetch," but I could not get them to feed on anything else but blackthorn, which they took readily to; and I succeeded in breeding fifteen fine ones. A strange habit I noticed in the larvæ was this, that if I opened a door in the room where they were they would all fall down and lay among the dead leaves for an hour before they would take to their food again.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTES ON THE SEASON OF 1882 IN Co. SLIGO.—My experience of the season of 1882, having been a bad one, agrees with that of most of your other correspondents. I have not, however, to record the absence of any usually occurring species, but the great scarcity of many generally the most abundant. This was more observable in the Diurni and Nocturni than in the other orders. *Pieris brassicæ*, for instance, was quite scarce, though the larvæ were very numerous in 1881; whilst of *Anthocharis cardamines*, remarkably abundant in this neighbourhood, three only were seen. *Lycæna alsus*, again, was almost as scarce; on the other hand, *Argynnis paphia* and *Chortobius davus* were, if anything, more abundant than usual. The following is the list of all my captures. The dates are arranged according to the month in which each species was first met with. In February, *Larentia multistrigaria* only. March, *Phigalia pilosaria*, *Anticlea badiata*, *Eupithecia pumilata*, *Tæniocampa stabilis*, *T. gothica*, and *Pterophorus pterodactylus*; *E. pumilata* was abundant, much more so

than in the second brood. April, *Scotosia dubitata*, additional, only was taken. I was absent in Scotland from the 8th of April, returning on the 4th of May. During May I took *A. cardamines*, *P. rapæ*, *P. napi*, *Satyrus megæra*, *L. alsus*, *Chærocampa porcellus*, *Nola cristulalis*, *Arctia menthastri*, *A. lubricipeda*, *Demas coryli*, *Rumia cratægata*, *Odontopera bidentata*, *Iodis lactearia*, *Cabera pusaria*, *C. exanthemaria*, *Numeria pulveraria* (very rich dark specimens), *Lomaspilis marginata*, *E. venosata*, *E. vulgata*, *Melanippe subtristata*, *M. montanata*, *M. fluctuata*, *Coremia unidentaria*, *Cidaria corylata*, *C. russata*, *C. suffumata*, *Eubolia palumbaria*, *Cymatophora duplaris*, *Xylophasias rurea*, *Noctua plecta*, *Abrostola urticæ*, *Gonoptera libatrix*, *Botys fuscalis*, *Pyrausta ostrinalis*; *C. porcellus* was unusually abundant, two or three falling to my net every evening, and nearly all at the flowers of some kind of vetch. In June appeared *Pieris brassicæ*, *Vanessa urticæ*, *C. davus*, and *C. pamphilus* (some specimens of the latter with the outer half of the fringe bright yellow); *S. ægeria*, *L. alexis*, *Hepialus lupulinus*, *H. humuli*, and *H. velleda* very abundant, and in variety both of marking and size; *Nudaria mundana* still more abundant; *Euchelia jacobææ*, *Metrocampa margaritaria*, *Boarmia repandata*, mostly a very pretty pale variety, quite unlike any I have seen elsewhere; *Fidonia atomaria*, *Aspilates strigillaria*, *Emmelesia albulata*, *E. castigata*, *E. constrictata*, *Thera simulata*, *Ypsipetes elutata*, *Camptogramma bilineata*, *C. populata*, *Pelurga comitata*, *Acronycta rumicis*, *A. putris*, *X. sublustris*, *X. lithoxylea*, *X. polyodon* and black var., this year much less numerous than usual; *Mamestra brassicæ*, *M. furva*, *Apamea basilinea*, *A. gemina*, *Miana strigilis*, *Caradrina cubicularis*, *Agrotis segetum*, *A. corticea*, *A. exclamationis*, *Tryphæna pronuba*, *Noctua c-nigrum*, *Hecatera serena*, *Euplexia lucipara*, *Ligdia adusta* common at sugar, *Hadena dentina*, *H. pisi*, *H. oleracea*, *H. thalassina*, *Cucullia umbratica*, *A. triplasia*, *Plusia gamma*, *P. chrysis*, *P. v-aureum*, *P. interrogationis*, *Scopula olivalis*, *Crambus culmellus*, *C. hortuellus*, *C. pascuellus*, *P. trigonodactylus*; one specimen of *P. interrogationis* was taken at flowers of sweet-william in my own garden, making the eighth species of *Plusidæ* so captured. In July the fresh arrivals were *S. janira* and *S. hyperanthus* amongst the Diurni; *Zygæna filipendulæ* absolutely swarmed on the sandhills; *Chelonia caxa*, *Bombyx quercus*, the larvæ of which were very abundant on the sandhills in May, feeding on the dwarf willow; *Ourapteryx*

sambucata, *Ellopiæ fasciaria*, *Cleora lichenaria*, *Venusia cambricaria*, *A. scutulata*, *A. aversata* and *A. bisetata*, *Abrazas grossulariata*, *Larentia didymata* and *E. pectinitaria*, *E. alchemillata* and *E. tæniata*, *E. nanata*, *E. centaureata*, *E. absynthiata*, *E. debiliata*, *Ypsipetes impluviata*, probably the autumn brood, as it was in good condition on July 12th; *Y. elutata*, *Melanthia ocellata*, *C. testata*, *E. mensuraria*, *C. immanata*, the usual forms; *Thyatira batis*, *Apamea oculea*, *Leucania conigera*, *L. pallens*, *Cerigo cytherea*, *C. alsines*, *N. triangulum*, *N. brunnea*, *N. baja* and *N. xanthographa*, *Dianthæcia carpophaga*, *P. bractea*, *Mania typica*, *T. lutealis*, *Hypena proboscidalis*, *Crambus perlellus*, *C. warringtonellus*, and *C. margaritellus*. *Emmelesia tæniata*, thanks to the kindness of Mr. Hodgkinson in sending me a sketch of the larva and food-plant, I hope to succeed in breeding. *T. bractea* was scarce, but I was fortunate in obtaining about 150 eggs from one, which I distributed to my friends, reserving twenty for myself: of these I have now feeding fifteen larvæ, and one pupa spun up on April 7th; many of the larvæ are still small, though all hatched at the same time. I am feeding them on groundsel and dumb-nettle; the former they seem to prefer; and as, since hatching, I have not lost one it seems to agree with them. In August my captures were *A. paphia*, *S. semele*, *L. olivata*, *C. russata*, *C. pyraliata*, *Anaitis plagiata*, *Nonagria fulva*, *Hydræcia nictitans*, which here varies very considerably, *Luperina testacea*, *Charæas graminis*, *A. cursoria*, *A. tritici*, *A. aquilina*, *A. obelisca*, *A. velligera*, *A. præcox*, *A. porphyrea*, *Polia chi*, *Epunda lutulenta* var. *lunibergensis*, *M. maura*, *Pyrausta purpuralis*, *Herbula cespitalis*, *C. tristellus*, *C. geniculellus*. This is the month for ragwort: *A. velligera*, *A. tritici* and *A. cursoria*, with an odd *A. præcox* and *E. lutulenta*, in the sunshine, are the principal captures; whilst at dusk *A. obelisca* and *A. aquilina* are to be found mixed with them. September, *Acherontia atropos*, *E. albulata*, *C. psittacata*, *H. micacea*, *N. glareosa*, *N. neglecta*, *Anchocelis lunosa*, *Xanthia ferruginea*, *P. pterodactylus*. *E. albulata* has been named before in my June list, and I have again inserted it here as being unknown to me to be double-brooded; my captures were only two, but in perfect condition. In October, *Xylina petrificata*, *Miselia oxyacanthæ*, *Phlogophora meticulosa*, and *Calocampa vetusta*, were all that occurred at ivy; *C. vetusta* was very scarce, whilst in 1881 it was quite easy to take forty or fifty in a night.—P. H. Russ; Cullenamore, Sligo, April, 1883.

CAPTURES IN 1883.—I have taken the following Lepidoptera up to this time:—*Gonepteryx rhamni*—one, at West Wickham; April. *Cymatophora flavicornis*—one, at a lamp near Croydon; April. *Calocampa vetusta*—one at sugar, West Wickham; April. *Brephos parthenias*—a few, West Wickham; April. *Pachynemias hippocastanaria*—one, Addington hills. *Tephrosia biundularia*—several, West Wickham; April. *Hibernia defoliaria*—two, West Wickham; January. *Lobophora lobulata*—several, West Wickham. Larvæ of *Thera variata*, one of *Ellopiopsis fasciaria*, and a number of small larvæ on juniper which I do not know.—W. M. GELDART; Croydon, April 24, 1883.

THECLA RUBI.—I do not know whether the appearance of *Thecla rubi* on April 12th is sufficiently early to be unusual, or of any interest to your readers. I mention the fact that I took one on this date on the cliffs here. I have only lived in this island for three years, but find on reference to my diary that in 1881 and 1882 the first specimens which came under my notice were on May 11th and 12th respectively. In all other instances this season appears extremely backward here, as I believe elsewhere.—(Rev.) FRANK E. LOWE; St. Stephen's, Guernsey, May 7, 1883.

LYCÆNA ACIS IN SUSSEX.—It may interest some of your readers to know that I have in my collection a specimen of *Lycæna acis*, caught by my late friend Thos. C. Hedley in the White Fields, Abbots Wood, in July, 1881. I saw the insect caught, so that I am sure of its authenticity.—J. A. DYNES; 3, Hardwicke Road, Eastbourne, May, 1883.

HERMAPHRODITE ORGYIA PUDIBUNDA.—A hermaphrodite imago of *O. pudibunda*, exhibited alive at the Royal Aquarium in March last, with the abnormal larva of *Melanippe montanata* figured in this number, was noticed in the breeding-cage by me on March 4th. It had the antennæ and wings of the male, with the body of the female, and was one of a brood of seventy which I obtained from a batch of ova. This specimen deposited eggs which were, as might be expected, infertile. They were all fed alike on the leaves of the common hazel.—E. H. JONES.

BOMBYX QUERCUS.—Whilst walking from Siena to Monastero my attention was attracted by an insect flying slowly by me, and making a noise like a large grasshopper on the wing. I followed it till it settled on the road, and on coming up to it I found it

was a male oak-egger (*Bombyx quercus*), with a piece of dry blackthorn attached to it. The lower part of the body was much lacerated, one thorn having gone quite through it, and the wings were a good deal torn. It had evidently got entangled, and in its efforts to escape had broken off a piece of the dead wood, from which it was unable to free itself.—J. L. BEVIS; Siena, April 5.

PUPA OF CYMATOPHORA FLAVICORNIS.—Mr. W. R. Buckell's description in last month's 'Entomologist' (Entom. xvi. 240) of his anomalous pupa of the above insect, with the head of the moth turned towards the tail of the pupa-case, is very curious and interesting, for the following reason:—Thomas Moufet, the father of British Entomology, in his 'Theatrum Insectorum,' London, 1634, says that during the final transformation of a lepidopterous insect the head of the pupa becomes the tail of the imago, and *vice versâ*. This statement, although disproved at some length by Swammerdam in his great work, published in 1669, has been frequently copied into "popular" works on Natural History during the last two hundred years, solely, I suppose, on Moufet's authority. I had always wondered why such an entomologist as Moufet should have fallen into such a grave error, for he was most careful to verify his statements by observation of facts, and conclude that he must have been led astray by a similar freak of Nature to that recorded by Mr. Buckell.—W. GARDNER; C. 18, Exchange Buildings, Liverpool.

ERASTRIA VENUSTULA.—In reply to Mr. Scott's query in last month's number (Entom. xvi. 114), I can only say that as far as my experience goes I have never seen the larva of the above-named species. I have also sought for the larva, but have never succeeded in finding it, having always assumed that it was absent from the place where I sought, but never had the slightest doubt that its food-plant was not *Tormentilla reptans*. Mr. Scott does not stand alone in his doubt, for I have since heard the same expressed by others whose experience has extended over a long period. I have hitherto accepted with broad faith the statements in the leading entomological works with regard to the food-plants of the species treated upon, and find it difficult even now to reject that which appears in Newman's 'British Moths,' viz. that *Tormentilla reptans* is the food-plant of *E. venustula*. I have no doubt that that painstaking entomologist had every reason for making the statement, but whether his information was based upon personal

observation or upon hearsay I cannot find any evidence. Although I have searched the 'Entomologist,' 'Entomologist's Monthly Magazine,' and the 'Entomologist's Weekly Intelligencer,' for many years back, I have failed to find any mention of this species feeding upon the plant mentioned. Mr. Stainton, in his 'Manual,' is silent upon the point, which would seem to indicate that he was not thoroughly certain about it. During my investigations I find that Mr. T. Eedle captured several in the year 1860, when *E. venustula* was considered a greater rarity than now, and which capture he chronicled in the 'Entomologist's Weekly Intelligencer,' and from which I presume he procured ova, for in a communication from him he states that he tried to breed *E. venustula*, having in the beginning about three hundred larvæ feeding during the month of July, that he fed them upon *T. reptans*, upon the flowers of which they at first appeared to thrive, but gradually showed a distaste for their food, and commenced to prey upon each other to such an extent that ultimately but one was left. He further stated that if he should attempt to breed them again he would do so separately. This would point to the fact that—like *Cosmia trapezina*, *Scopelosoma satellitia*, and others—the species in question is of a cannibalistic tendency, which I fail to find mentioned in any work on the subject. His remarks would also lead to two assumptions, viz., that he did not keep them sufficiently supplied with fresh food, or that the food was not adapted to them during their more advanced stages. The former could be easily proved by feeding them separately; but if the latter assumption is correct, then *T. reptans* is not the proper food. I find that Mr. E. G. Meek has succeeded in breeding it upon *Tormentilla reptans*, but he states that it is a difficult and delicate thing to rear. The specimens, contrary to the usual rule, are not nearly so well marked, nor in any respect so fine, as those which have been captured. This would likewise tend to prove that *T. reptans* is unsuitable as a food-plant, and I shall be very pleased to hear from anyone who has had experience in breeding it, and to what their experience leads them. Coming as this note does *apropos* to the time when *E. venustula* should be on the wing, perhaps some of our friends, especially those who work the Horsham district, who will doubtless take some during the current month, will take the trouble to get a batch of ova and settle the question, or, what will be preferable, search the blossoms of

T. reptans during July and August, and perhaps by that means render it certain that it is the proper food-plant. I am much obliged, however, to Mr. Scott for raising the question, as it is by such means that the habits of various species are chronicled, and prove useful in settling vexed questions; and it is much to be regretted that many more who take up Entomology as a study do not more freely give their experience for the general good.—W. H. WRIGHT; Secretary's Department, Inland Revenue, Somerset House, May, 1883.

[Newman distinctly says that his description of this larva was from living specimens given to him by Mr. C. J. Biggs, a frequent contributor to this journal. There is nothing relating to *E. venustula* beyond a record of captures in our own Natural-History journals; but Professor Hering says that most probably sheep-sorrel (*Rumex acetosella*) is the food-plant of the larva in Pomerania.—E. A. F.]

NEW BRITISH TRICHOPTERON.—While examining a small collection of caddis-flies formed by Mr. Service, of Dumfries, one specimen, a male, gave me considerable trouble, as it did not agree in certain details with any of the species described in Mr. M'Lachlan's 'Monographic Revision and Synopsis of the Trichoptera.' I submitted the specimen to Mr. M'Lachlan, who at once informed me that it was *Merophylax aspersus*, Ramb., variety. The species has been recorded from the South of Europe, while the variety has been taken at the Lake of Zurich in May and September. Unfortunately Mr. Service cannot give any date or exact locality where his specimen was captured; but he informs me that all the insects in the collection were taken within Torqueer parish, Dumfriesshire, he having only collected caddis-flies in three localities, so I hope that he may be able to turn up this species again. With his usual kindness he has placed the specimen in my cabinet. For a description of the species I would refer workers to that of *Stenophylax aspersus*, Ramb., in Mr. M'Lachlan's work already mentioned, page 132; and for that of the variety to the third supplement (not yet published) of that work.—J. J. KING; 207, Sauchiehall Street, Glasgow.

ERRATUM.—May number, page 109, line 7 from top, for "simile" read "smile."

ENTOMOLOGICAL SOCIETY OF LONDON.

FIFTIETH ANNIVERSARY.

May 2, 1883.—J. W. DUNNING, Esq., M.A., F.L.S., &c., President, in the chair.

The President read the following Address:—

“GENTLEMEN,—Before proceeding to the important business of the evening, I crave your indulgence whilst I make a few preliminary remarks. You scarcely need to be reminded that we this day complete the fiftieth year of our existence. It was on the 3rd May, 1833, that nine gentlemen—Messrs. Children, J. E. Gray, G. R. Gray, Hope, Horsfield, Rudd, Stephens, Vigors, and Yarrell—met and resolved to found the Entomological Society of London. No time was lost; for on the 22nd of the same month the first General Meeting was held at the Thatched House Tavern, the Rev. Wm. Kirby was chosen Honorary President, 103 Members were enrolled, and a Council of thirteen were chosen to complete the organization of the Society and prepare rules for its government. Rooms were taken at No. 17, Old Bond Street, and on the 4th November, 1833, under the Presidency of Mr. Children, the then Secretary of the Royal Society, a code of Bye-Laws was adopted, and our first scientific meeting was held.

“Of the Original Members, six, and six only, still survive—Prof. C. C. Babington, the Rev. Leonard Jenyns (now Blomefield), Sir Sidney S. Saunders, Mr. W. B. Spence, Mr. G. R. Waterhouse, and Prof. Westwood. Of these Mr. Waterhouse has the additional distinction of having been one of the original Council, and the first Curator of the Society.

“Our meetings continued to be held at 17, Old Bond Street from 1833 until 1852, when we removed to No. 12, Bedford Row; during nine sessions commencing in 1866, by the kindness of the Linnean Society, we assembled in Burlington House, but our Library remained at Bedford Row. In 1875 the Library and place of meeting were again united in this house; and though the building operations now in progress have prevented us from indulging in any celebration of our Jubilee, we shall soon be in the enjoyment of improved accommodation, and I hope it may be long before the Society has again to change its quarters.

“The Bye-Laws have been from time to time revised—in 1834, 1838, 1847, 1848, 1851, 1855, 1862, 1864 and 1876; but, in the main, the original rules still govern us. In 1838 the class of Corresponding Members was instituted; in 1848 Annual Subscribers were allowed; and in 1851 the grade of Associates was introduced. The last-mentioned class was abolished in 1855; and you are to-night to be invited to consider the

propriety of reverting to the original constitution, by prohibiting the future election of either Corresponding Members or Annual Subscribers, and leaving those classes to gradual extinction, or, as it is hoped, to absorption among the Ordinary Members.

“At the present moment we have 33 Subscribers and 205 Ordinary Members, making a total of 238 contributing Members. Three years ago I ventured to express from this chair a hope that we might be able to publish a Jubilee List of not less than 300 Members. It is not yet too late. And I appeal to each and all of you, Gentlemen, to be active in striving to attain this object.

“‘The Entomological Society of London is instituted for the improvement and diffusion of Entomological Science.’ From first to last, this has been our only object. To bring fellow-workers into friendly communication, and facilitate the interchange of ideas, to extract the hidden knowledge of secluded students, to provide a Library for consultation, to encourage observation and experiment, and to publish the results for the benefit of all whom they may concern—such is our aim, the very reason of our being. And I venture to assert that the Society has succeeded in its object. If any be inclined to doubt, I refer him to the thirty volumes of our ‘Transactions,’ to the record of ‘Proceedings’ at our more than 600 meetings, as proof of the activity and the unfailing ardour with which the Society has now for half a century devoted itself to the diffusion of Entomological Science.

“Let me recall the names of some who in their day were enrolled in our ranks—such men, for instance, as Adams, Allis, Atkinson, Bainbridge, Bakewell, Bedell, Bell, Bevan, Bladon, Bowerbank, Bree, Brown, Champion, Children, Clark, Crotch, Curtis, Darwin, Dawson, Desvignes, the Doubledays, Evans, Gould, the Grays, Guyon, Haliday, Hewitson, Hope, Horsfield, Howitt, Ingall, Ingpen, Jesse, Kirby, Lee, Macleay, Melly, Murray, Newman, Newport, Pickering, Raddon, Roget, Saunders, Shuckard, Smith, Solly, Spence, Spry, Stephens, Swanzey, Swainson, Sykes, Thwaites, Turner, Vigors, Wailes, Walker, Walton, White, Wollaston, and Yarrell.

“I might have added others to this list of departed worthies, and I am prohibited, by the fact that they are still amongst us, from mentioning many distinguished men; but the names I have recited, including students and workers in Entomology who have left their mark behind them, and others who happily were not limited to our own or even to kindred branches of Science, are sufficient to cast no light burden upon us and our successors to maintain the traditions of this Society. Is it nothing that we should stand in the place of such predecessors? Is it nothing that this Society should have formed a bond of union and friendship between them? Surely an Association like this fulfils a useful purpose if it does nothing more

than perform the humble function of the string that binds the pearls together.

"At the outset it was part of the plan of operations that a Collection of Insects should be formed; and in 1835 the Rev. Wm. Kirby presented his entire collection of entomological objects to the Society, unfettered by any restriction whatever. It was found, however, that the formation and maintenance of a General Entomological Museum were more than the resources of the Society would warrant; and in 1855 the Exotic Collection was discontinued. Eventually, after thirty years' experience, the formation of a British Collection was also abandoned; the Kirbayan cabinets, and all the type-specimens, found a permanent home in the British Museum; and the Curator of the Society was merged in the Librarian.

"Of the nine gentlemen who have filled the office of Curator or Librarian,—Messrs. Waterhouse, Pickering, Shuckard, Westwood, Bainbridge, Frederick Smith, Janson, T. A. Marshall, and Grut,—Mr. Smith occupied it for fourteen and Mr. Janson for twenty years; the present occupant is only in his sixth year of office, but it must be the wish and hope of all that he will continue to give us the benefit of his services for many years to come.

"Of Treasurers we have had but six—Messrs. Hope, Yarrell, Samuel Stevens, M'Lachlan, J. Jenner Weir, and Edward Saunders. Of these Mr. Yarrell acted for eighteen and Mr. Stevens for twenty years. I trust the present Treasurer will grow as old in office as the oldest of his predecessors.

"Originally there was but one Secretary, and the first was George Robert Gray; but at the beginning of 1834 he gave place to Mr. Westwood, and although Mr. W. B. Spence was for two or three years appointed Foreign Secretary, it was not until 1847 that two Secretaries were authorized by the Bye-Laws, and Mr. Westwood was provided with a colleague. The subsequent occupants of the office have been Messrs. Evans, Edward Doubleday, Douglas, Stainton, Wing, Shepherd, Janson, Dunning, Sharp, M'Lachlan, Grut, Verrall, Butler, Meldola, Distant, Fitch, and Kirby; so that by a curious coincidence the Society has during fifty years had just as many Secretaries as it has had Presidents.

"Including our Honorary President, who died in 1850 at the patriarchal age of ninety-two, I have had twenty predecessors in this chair. It has throughout been one of our rules that the officers shall be elected annually, and that the President shall not hold that office for more than two years consecutively. Messrs. Children, Stephens, Newport, Spence, G. R. Waterhouse, Newman, J. E. Gray, Douglas, F. Smith, Pascoe, A. R. Wallace, Sir S. S. Saunders, and Stainton have each held it for two consecutive years; Mr. Curtis for one year; Mr. Bates for three; Mr. W. Wilson Saunders and Sir John Lubbock for four; the Rev. F. W.

Hope and Professor Westwood each for six years. Nine of the twenty are still amongst us, and I am pleased to see that several of them are present this evening.

"Gentlemen, I can only regret that, by the irony of fate, it has fallen to *my* lot to fill the Presidential Chair on this occasion, when, of all others, it ought to have been occupied by one of the Fathers of British Entomology. But you have willed it otherwise, and I will bury my regret; nay, it is already swallowed up in the delight I feel at the commission with which I have been entrusted by the unanimous voice of the Council, and I am sure that the proposition I have now to make will meet with your approval, and be carried by acclamation.

"I have to suggest that Professor Westwood be made titular Life-President of the Society.

"There is no man to whom we as a body owe so much. An Original Member, he has never failed us; during the crucial period of our childhood he was the motive power, the life and soul of the Society; for fourteen consecutive years he was Secretary, and for part of that time he was Curator also. The Council has seldom been complete without him; he has been Vice-President times without number, and during six years (1851-52, 72-73, 76-77) he was our President. Whilst he resided in or near London, he rarely missed one of our meetings; even Oxford cannot keep him away from us; and there is not a single year from first to last that he has not been a contributor to our 'Transactions.' From 1827 to the present time his pen and his pencil have never been idle; his papers are scattered broadcast over the scientific publications of this and other countries; and to single out a few of his more important works it is enough to mention the 'Introduction to the Modern Classification of Insects' (1839-40), the 'Arcana Entomologica' (1841-45), the 'Cabinet of Oriental Entomology' (1848), the 'Genera of Diurnal Lepidoptera' (1852), and the 'Thesaurus Entomologicus Oxoniensis' (1874). What do we not owe to Westwood's 'Introduction'? has it not been to many of the present generation of entomologists the very fountain and sole source of their scientific views? His labours have ranged over the whole domain of our Science. Specialists may excel in their own particular groups, but as a general entomologist have we a man to compare with him?

"Scientific bodies, both at home and abroad, have delighted to do him honour: the Entomological Societies of France and Holland, of Berlin, Stettin, and St. Petersburg have claimed him for their Honorary List: other Scientific Associations in France, Germany and Austria, in Russia and Scandinavia, in the United States of North America and the Dominion of Canada, have vied with each other in conferring upon him such distinctions as lay in their power; Brazil has made him a Knight of the

Imperial Order of the Rose; and if scientific knighthood carried any outward sign, his breast would be one blaze of stars.

"At the foundation of the Society the joint authors of the 'Introduction to Entomology' were chosen Honorary Members. It was at the same time made one of our Bye-Laws that no other resident in the United Kingdom should be an Honorary Member; wisely, as I think, we have retained that Bye-Law, and I hope we shall retain it. The proposition to be submitted to you involves no infraction of that rule.

"But, in addition to the Honorary Membership which he shared with Spence, the venerable Kirby was made Honorary President for life. And it occurred to our Secretary who bears that honoured name that it would be a graceful act to confer a similar distinction upon Professor Westwood. As Kirby's position was unique in 1833, so is Westwood's now; and it needs no Bye-Law to forbid a recurrence of to-night. The laws of Nature will prevent it; for long before our second Jubilee the Original Members will be no more.

"I do not propose to abdicate the functions with which your kindness has invested me. But if it be your pleasure to adopt the suggestion that has been made, I shall be proud to recognise Prof. Westwood as my titular Chief, and to yield the Chair to him at any of our Scientific Meetings when we are favoured with his presence. I know no better way of showing that our constancy is equal to his, and that our gratitude is enduring and life-long. It is a barren title and an empty honour, but it is all that we as a Society can bestow. He has grown grey in our service, and in recognition of his services, to us in particular and to our Science in general, I ask you to confer upon him a title which will be a standing record of the esteem in which we hold him, and which throughout the evening of his days shall assure him of our affectionate respect."

• This proposal was carried by acclamation, and Professor Westwood was declared Honorary Life-President of the Society.

SPECIAL MEETING.—A Special Meeting having been convened, pursuant to a requisition presented to the President and Council, for the consideration of certain proposed alterations in the Bye-Laws, which had been read at the three preceding meetings of the Society,—

Mr. E. A. Fitch proposed, and Mr. Pascoe seconded, that the Annual Contribution for a Member be raised from One Guinea to Two Guineas, and that Chapter 13 of the Bye-Laws be altered accordingly. The meeting was addressed by Messrs. Sheppard, Distant, M'Lachlan, Stainton, Kirby, Grut, C. O. Waterhouse, Lloyd, Edward Saunders, and Sir Sidney Saunders; and by Mr. Fitch in reply. The proposal was negatived by 19 to 5. A proposal to abolish the Admission Fee was withdrawn.

Mr. Grut proposed, and Sir Sidney Saunders seconded, that no more Annual Subscribers should be elected, and that Chapter 2 of the Bye-Laws should be altered by adding thereto the words, "But no Subscriber shall hereafter be elected." The meeting was addressed by Mr. Kirby and Mr. Fitch; and the proposal was carried by 23 to 2. The proposed consequential alterations in Chapters 12 and 15 were likewise carried.

Mr. W. F. Kirby proposed, and Mr. C. O. Waterhouse seconded, that no more Corresponding Members should be elected, and that Chapter 2 of the Bye-Laws should be altered by striking out the words "Corresponding Members." The meeting was addressed by Mr. J. Jenner Weir, Sir Sidney Saunders, Messrs. Fitch and Stainton; and the proposal was carried by 15 to 3. The proposed consequential alteration in Chapter 16 was likewise carried.

Mr. E. Saunders proposed, and Mr. Alfred Lloyd seconded, that every Member who has paid the Annual Contribution for the year shall be entitled to a copy of the 'Transactions' published during the year, and that Chapters 15 and 21 of the Bye-Laws be altered accordingly. The meeting was addressed by Messrs. Salvin, Stainton, Waterhouse, Weir, Kirby, Distant, and Sir Sidney Saunders; and the proposal was carried by 25 to 3.

Mr. M'Lachlan proposed, and Mr. C. O. Waterhouse seconded, that the mode of election of the Council and Officers be altered by requiring notice to be given of candidates proposed to be substituted for any of the Members recommended by the Council, and that Chapter 20 of the Bye-Laws and the Schedule thereto be altered accordingly. The meeting was addressed by Mr. Jenner Weir, Mr. Wormald, and Sir Sidney Saunders; and the proposal was carried by 16 to none.

The result was that the proposed alterations in Chapters 8 and 13 were not carried; and that all the proposed alterations in Chapters 2, 12, 15, 16, 20 and 21 were carried.

The Ordinary Meeting was then resumed.

The minutes of the April meeting were read and confirmed.

Donations to the Library were announced, and thanks voted to the respective donors.

Messrs. E. A. Butler (Arnold House, University School, Hastings) and W. H. Miles (33, Paris Street, Palace Road, Lambeth, S.E.) were balloted for and elected Members of the Society.

In consequence of the lateness of the hour all scientific business was postponed to the next meeting.

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[No. 242.]

MEMORANDA ON INSECTS IN THEIR RELATION TO FLOWERS.*

BY ROBERT MILLER CHRISTY.

THE following are details of observations taken at intervals upon the methodic habits of insects—principally of Fossorial Hymenoptera—when visiting flowers in search of honey.

1.—April 22, 1881. Pounce Wood, near Saffron Walden. A specimen of *Bombus scrimshiranus* which I watched exhibited most systematic habits, as it seemed to visit every flower on each umbel of *Primula elatior* that it settled upon, then went over, in a similar manner, all the other umbels on the same plant, afterwards going to the next nearest plant, the flowers on which were treated just the same.

2.—Sept. 9, 1881. Top of Hambleton Hills, Yorkshire. A large humble-bee visited flowers of *Digitalis purpurea* many times, avoiding all other sorts.

3.—Sept. 14, 1881. Garden at Chignal St. James, Essex. Many flowers were out, but a large black and yellow humble-bee, with the hinder part of its body whitish, visited red *Antirrhinum majus* and red *Nasturtium* only, alternately, the following number of times, commencing with the former:—39, 2; 7, 3; 10, 3; 12, 1; 27, 2; 1, 2; 14 (*Antirrhinum*); it then took a long flight, visited two flowers of *Lamium purpureum* (also red), and disappeared. Thus this bee made in all 125 visits, but it did not seem to be at all systematic in only once visiting particular flowers of *Antirrhinum*, but sometimes entered a flower twice over, refusing to visit others at all—generally, I believe, those that were rather

* For further information on this subject consult a paper read by me before the Linnean Society, March, 1883, and now being published in the Society's journal.

withered. It will be noticed that all the flowers visited were red, and that although the *Antirrhinum* and *Nasturtium* were visited alternately, the number of consecutive visits paid to the former were (with one trifling exception), always greater than to the latter.

4.—Sept. 18, 1881. On a flowery roadside bank near Audley End, Essex, I watched a bee of the same species as the foregoing. It paid 46 visits to *Thymus serpyllum*, 6 to *Lamium purpureum*, 4 to thyme, and was then missed, but half a minute later the same bee visited *Lamium purpureum* 10 times, *Thymus serpyllum* once, a yellow *Hieracium* 5 times, *Lamium purpureum* 4 times, *Lamium album* twice (buzzed round *Urtica dioica* as if looking for flowers), *L. purpureum* 19 times, *L. album* once, *L. purpureum* 16, and then flew away altogether. This bee therefore paid 114 visits to four species of flower, of which two were reddish, one white, and one yellow. The number of visits paid altogether to each species is as follows:—*T. serpyllum* 51, *Lamium purpureum* 55, *L. album* 3, and *Hieracium* 5. This certainly does not show much method.

5.—Same date and place. A smaller, darker bee, but otherwise much the same as the last, visited *Lamium album* only, 49 times before being lost sight of.

6.—Same date and place. A bee of the same species visited *Lamium album* 31 times and was lost, having avoided all else.

7.—Same date. Railway-bank, near Saffron Walden. A large humble-bee visited 5 flowers of *Senecio jacobæa*, 1 of *Centaurea nigra*, and 1 of *S. jacobæa*, and was lost.

8.—Same date and place. A smaller bee passed, with only a momentary hesitation, some flowers of *S. jacobæa* and *Hieracium*, but afterwards visited 5 of *Centaurea nigra*, 1 of *S. jacobæa* and was then lost.

9.—Same date and place. Another bee of the same species visited *C. nigra* six times in succession, and was lost.

10.—Same date and place. This observation was made on a most industrious but unmethodic bee of the same species as the last. It visited the following flowers the following number of times:—*Senecio jacobæa* 22 (many being however the same flower twice visited), *Hieracium* 1 (passing a *Ranunculus* (? *bulbosus*) with only a momentary glance), *S. jacobæa* 43 (many of them on plants already visited more than once), took a short flight and inspected several flowers of *Ranunculus bulbosus*,

Hieracium, *Verbascum nigrum*, and *Hypericum perforatum*, then visited *S. jacobæa* 16 times, *Hieracium* once, *S. jacobæa* 10 times (on a plant already visited), revisited for a moment plants of *Hypericum perforatum*, then actually returned to plants of *S. jacobæa* previously visited, again sucking the flowers thoroughly, afterwards going to *Hieracium* 1, *S. jacobæa* 9 (on a fresh plant), touched *Trifolium pratensis* and a flower of *Hieracium*, thoroughly visited the flowers on a fresh plant of *S. jacobæa*, then went back to several of the old plants of *S. jacobæa* already (to all appearances) well visited several times, and revisited them thoroughly, afterwards visiting five flowers of *Malva sylvestris*, and finally flying off. As all this took place within an area of 10 or 20 yards square, this bee evidently did not believe in being very methodic, or in taking very long excursions. Most of the flowers on the bank were yellow, such as *Senecio jacobæa*, *Hieracium*, *Hypericum*, and *Verbascum*. The bee paid about 200 visits to 5 species, 3 of which were yellow and 2 red. I counted 91 visits to *Senecio*, but the real number must have been at the very least twice that, while the visits to *Hieracium* were 3, to *Hypericum* 1, to *Trifolium* 1, and to *Malva* 5. The visits to the three last-named species were very short, so that perhaps the error was perceived before the nectar was sucked.

11.—Sept. 25, 1881. A garden with a great variety of flowers at Great Saling, Essex. A large humble-bee visited one flower of the *Agapanthus* lily, several flowers on five plants of red *Antirrhinum majus*, one a pink *Hydrangea*, touched white *Antirrhinum* but passed the red unnoticed. Several minutes later the same bee (I think) visited many flowers on another plant of *Agapanthus*, thrice taking flights and returning, then, after a long rest on the greenhouse, visited two flowers of *Delphinium* and was lost. This observation shows very little method, if any.

12.—Same date and place. A smaller bee visited several flowers of scarlet geranium (perhaps only settled on them), two of *Nasturtium*, several on *Linaria cymbalaria* and was then lost.

13.—Same date and place. A small humble-bee, first seen on *Delphinium*, visited several flowers both of *Fuchsia* and of scarlet *Lithospermum*, returned to *Fuchsia* after having touched *Geranium* and was lost.

14.—Sept. 26, 1881. Bridge-End Gardens, Saffron Walden. Many garden flowers growing around, such as pink and white

phloxes, pink stock, yellow pyrethrum, dahlia, and a quantity of *Campanula* (? *media*—the large Canterbury bell). Late in the evening I watched a humble-bee at work on the *Campanula*, and kept account of the number of flowers it visited on each different plant. The results were as follows:—6, 5, 1, 3, 1, 2 (on the plant visited first), 2, 1, 1, 1, 5, 3, 1, 1, 3, 2, 2, 2, 2, 3, 8, 3, *i.e.*, 58 flowers in all on 21 plants.

15.—Same date and place. A similar bee visited the *Campanula* as follows:—7, 4, 2 and 2, *i.e.*, 15 flowers on 4 plants.

16.—Same date and place. A similar bee visited the *Campanula* 5 and 10 times, *i.e.*, 15 flowers on 2 plants.

17.—Same date and place. A similar bee visited the *Campanula* 2, 10, 4, 8, 6 and 11 times, *i.e.*, 41 flowers on 6 plants. These four observations show absolute constancy, inasmuch as 4 humble-bees paid 129 visits to flowers on 34 plants of *Campanula*, without once visiting another species, though in the last case the bee settled momentarily on a flower of pink stock. Many flowers of *Campanula* were, however, obviously rejected—the bee going to the entrance but no further, perhaps because the flower was withering or had just been visited, so that the bee was in some way enabled to perceive the absence of nectar.

18.—Oct. 2, 1881. Meadow in Navestock Park. No flowers present, but a quantity of *Scabiosa succisa* and an occasional *Ranunculus* (? *acris*). A humble-bee was observed to make 13 visits to the former.

19.—Same date and place. Another humble-bee paid 32 consecutive visits to *Scabiosa succisa*, and was lost.

20.—Same size and place. Another humble-bee visited *Scabiosa succisa* 57 times, although in this case there were several other species near. Several times I caused a head of flowers to be twice visited thoroughly, by picking it and presenting it to the bee.

21.—March 8, 1882. Garden at Chignal. A hive-bee which I watched, clearly rejected several flowers of *Galanthus nivalis* and red *Primula vulgaris*, but paid 14 visits to flowers (some of them visited twice) on 4 different plants of yellow *P. vulgaris*, and was then lost. Other early spring flowers grew around.

22.—March 12, 1882. Near Audley End, Essex. Observed a hive-bee to visit 14 flowers of *Ranunculus ficaria* and then fly away. No other species on the same spot.

23.—March 15, 1882. Westley Wood, Saffron Walden. A male specimen of *Anthophora acervorum* paid five visits to *Primula vulgaris* and was then lost. *Endymion nutans* and *Ranunculus ficaria* grew around.

24.—March 19, 1882. Fox's Wood, Great Bardfield, Essex. *Ranunculus ficaria* grew in great abundance in an open part of the wood, mixed with a few other species. A small tortoiseshell butterfly, *Vanessa urticæ*, visited it 19 times, then settled on the ground and afterwards flew away.

25.—April 10, 1882. Meadow at Great Bardfield. An individual of *Anthophora acervorum* visited consecutively 108 flowers of *Primula elatior* (which was abundant), rejecting many, but without even hesitating at the flowers of any other species, although quantities of *Ranunculus ficaria* grew on the same spot, and *Cardamine pratensis*, *Bellis perennis*, *Ranunculus acris*, *Nepeta glechoma*, *Leontodon taraxacum*, &c., were out close by.

26.—April 11, 1882. Avesey Wood, near Thaxted. *Primula elatior* and violets (*Viola*? *canina*) in very great profusion intermixed, but no other species of any importance. Plenty of hive-bees were visiting both species, but I did not observe any change from one to the other.

27.—Same date and place. An individual of *Bombus scrimshirani* which I watched seemed to be visiting flowers of *P. elatior* and *Viola canina* one after another, apparently with perfect indifference.

28.—Same date and place. An individual of *Anthophora acervorum* which I watched did exactly the same as the last bee mentioned.

29.—April 11, 1882. An open part of Grassy Wood, Wimbish. I watched many hive-bees visiting flowers of *Primula elatior*, *Viola canina*, *Ranunculus ficaria*, and *Mercurialis perennis* (all of which grew in abundance), but did not see one single instance in which a bee changed from one species to another.

30.—Same date and place. A hive-bee visited *Primula elatior* 23 times, having avoided all else when I caught him.

31.—Same date and place. A sulphur butterfly, *Gonepteryx rhamni*, visited *Primula elatior* 3 times and departed, having passed over all else.

32.—May 11, 1882. A cut-down wood immediately behind Chelsfield Station, Kent. At one spot *Galeobdolon luteum*,

Euphorbia amygdaloides, *Ajuga reptans*, and *Primula vulgaris* grew abundantly, with a few plants of *Endymion nutans*, *Myosotis palustris*, *Stellaria media*, *Potentilla reptans*, *Ranunculus auricomus*, *Senecio vulgaris*, and a small scarlet *Vicia* (? *lathyroides*). A hive-bee, which whilst I watched it kept to a very small area of ground, confined itself entirely to the *Galeobdolon*, which it visited no less than 117 times before I lost it, though between these visits it took one short and one longer flight, and also hovered round, but rejected, *S. vulgaris*, *R. auricomus*, 3 plants of *E. amygdaloides* and 3 of *Galeobdolon*, all of which, it may be noticed, have more or less yellow flowers. This is, I think, in every respect the most satisfactory observation which I have to record, and, as is the case with nearly all my observations on the hive-bee, shows absolute constancy.

33.—May 17, 1882. In a meadow at Chignal I watched a hive-bee whose head, thorax and body were covered with pollen, and which visited 43 flowers of *Ranunculus* (? *acris*), avoiding many of the older flowers, but not looking at any other species, although *Trifolium pratensis*, *Rhinanthus crista-galli*, and *Stellaria media* were pretty plentiful at the same spot.

34.—May 17, 1882. Wood at Chignal. A black humble-bee, striped behind with yellow and white, made 52 visits to *Ajuga reptans*, then one to *Viola canina* (also blue), and afterwards flew right away, having passed over *Ranunculus auricomus* and *Lychnis diurna*.

35.—May 28, 1882. Meadow at Chignal. A small humble-bee, striped behind with yellow and gray, visited *Trifolium pratensis* 7 times, passing over abundance of *Ranunculus acris*, with some *Bellis perennis*, *Chrysanthemum leucanthemum*, *Cardamine pratensis*, and *Lychnis flos-cuculi*.

36.—Same date and place. A large humble-bee with reddish thorax visited *Trifolium pratensis* 9 times, rejecting all else.

37.—Same date and place. A large humble-bee, red behind, visited *Trifolium pratensis* 11 times, avoiding all beside when I disturbed it.

38.—May 29, 1882. In a meadow at Chignal a hive-bee which I watched paid 47 consecutive visits to *Ranunculus acris*, passing over plenty of *Trifolium pratensis*, *Bellis perennis*, *Heracleum sphondylium*, a small *Rumex* and *Stellaria media*.

(To be continued.)

THE MACRO-LEPIDOPTERA OF EPPING FOREST IN JULY.

BY ARTHUR J. ROSE.

ONLY those who have really gone through it can form any adequate idea how perplexed a beginner feels when July comes upon him, bringing with it, as it does, an emergence of more than half the imagines of our whole species of British Lepidoptera. It is at this time that he feels most the want of a helping hand to put him in the right way of working, and to point out the localities where such species as he may be in search of may be found.

Having gone through this critical stage, viz. that of the early beginner, I remember perfectly well how much use it would have been to me had I had some trustworthy guide to look for information with reference to the insects found in Epping Forest; and it is this experience which leads me to extract from my journal a list of species which occur there, so that the young student may be able to form some idea of what he may fairly expect to find. Of course at the outset he must not expect to get all the species that I enumerate in one season, as my diary extends over several years; but by working continuously he will find that many of those named will be among his captures. Although I write with the main idea of assisting the younger students, many of whom are numbered among the readers of the 'Entomologist,' yet this article may enable some of our more advanced readers to fill some neglected rows in their cabinets.

Now that Epping Forest is more accessible than in former years it presents a collecting ground not to be despised, and anyone working it continuously will find it far from unprofitable, and it will be found especially so to the beginner.

During the current month may be found a list of butterflies, which, taking into account the proximity of London, is by no means a despicable one. It is not yet too late to take a series of *Argynnis selene*, although it would have been in better condition had it been taken a week or two earlier. In the same locality, viz. near the "Wake Arms," *A. adippe* will be found throughout the month. Not far off, viz. at the King's Oak at High Beech, *Lycæna ægon* may be taken from the beginning to the third week. *Satyrus megæra* and *S. ægeria* may be seen on any fine day in any

part of the Forest, but generally plentifully in that to the west of Monk's Wood. In like plenty may also be found *L. alexis*, *Vanessa urticæ*, *Pieris napi*, *P. rapæ*, *P. brassicæ*, and *Polyommatus phlæas*. In the lower grounds, and almost all over the Forest, the skippers are represented by *Hesperia sylvanus* and *H. linea*. Towards the end of the month *Gonepteryx rhamni*, the second brood of *L. argiolus*, *V. polychloros*, *Thecla betulæ*, and *T. quercus*, may be found, the latter often in great plenty. Around the fields and open glades sporting in the sunshine will be found almost everywhere *S. tithonus*, *S. janira*, and usually swarms of *S. hyperanthus*. *Colias edusa*, if it should occur in any numbers, will be sure to show up on the edges of the Forest.

A visit to High Beech early in the month may not be too late to obtain *Erastria venustula*, and still further on in Monk's Wood, by diligent searching on the trunks of the trees, *Stauropus fagi* may yet be taken. *Procris statices* also, about Chingford and Sewardstone, may yet be found on the tops of the clover and on the flowers of the ragged-robin. *Liparis monacha* will also be upon the wing, but it is not common, although another of the same family, viz., *L. auriflua*, abounds. *Nola cristulalis*, and *L. salicis*, on the borders of the Forest around Walthamstow, and *Calligenia miniata* also will be out, and on the trunks of the willows, *Cossus ligniperda*. Those who neglected to obtain *Odonestis potatoria* in the larval state will be able to do so now upon the wing. *Notodonta camelina* will not yet be over, nor *Platypteryx hamula*. *Bombyx neustria* may be seen, and the second brood of *Cilix spinula* may now be taken. *B. quercus* is out this month and particularly abounds along the lanes of Sewardstone, and anyone who has bred a female may do well at assembling. To those of a very patient turn of mind, a fair amount of searching on the black poplar, in the vicinity of Monk's Wood, may yield reward in the shape of larvæ of *Clostera reclusa*, and those who like beating may hope to find on the oak the larvæ of *N. chaonia*, *N. dodonea*, and *N. trepida*, and the honeysuckle should be searched for the larvæ of *Macroglossa fuciformis*. Among the *Lithosidæ* on the wing may be mentioned, *L. complanula*, and the *Zygæna* family is represented by *Z. filipendulæ*, both obtainable at Chingford.

The list of Geometræ will be found to be very varied and extensive, so much so in fact that our space in this journal will

only allow an enumeration of a part of the number. Among the species most in repute may be mentioned *Phorodesma bajularia*, *Angerona prunaria*, *Geometra papilionaria*, and *Pericallia syringaria*. The first-named may be taken both at Chingford and the Hagger Lane Forest, and sometimes occurs in large numbers throughout the month. The graceful flight of *A. prunaria* may be witnessed almost everywhere in the Forest at dusk, especially in that part of it abutting on Chingford Station, and as several dozen may be taken on almost any fine evening, a varied series may be had without much difficulty. *G. papilionaria* is taken, although sparingly, wherever the birch abounds, and *P. syringaria* at Walthamstow and High Beech. Of ubiquitous occurrence may be mentioned *Cabera exanthemaria*, *Metrocampa margaritaria*, *Hemithea thymiaria*, *C. pusaria*, *Acidalia aversata*, *Melanthia ocellata*, *Coremia ferrugata*, *Melanippe subtristata*, *A. bisetata*, *Cidaria fulvata*, and many varied forms of *Ypsipetes elutata*, both of the latter insects often coming to sugar. Hedges around Walthamstow near which the ragged robin grows will furnish us with *Emmelesia decolorata*, and wherever the common chervil grows there will be found *Larentia didymata*. *M. rubiginata*, *Ephyra punctaria* and *Ligdia adustata* are to be found everywhere, and *Timandra amataria* may be secured in most parts of the Forest. The rapid flight of *Ourapteryx sambucata* will be seen true to its time, viz., about the 10th July, and is one of the best time-markers among the Geometræ. *Camptogramma bilineata* will furnish the young beginner with a varied series, from light yellow to dark brown, and *Abraxas grossulariata*, common though it is, will generally repay the earnest worker by revealing many variations of marking and colour. *Pseudoterpna cytisaria* is now on the move, and the beginner will find how difficult it will be to get a satisfactory series, and will remember next year that the best way to get it in good condition is to collect the larva, which being of a light green colour, with a purple marking along the spiracles, forms a pretty object when feeding on the *Genista anglica*, which it does early in June, wherever that plant is found growing in the Forest. Among the thorns I may enumerate *Selenia illunaria*, *Crocallis elinguaris*, *Ennomos angularia* (Monks Wood, plentiful.) Many more may be brought into view by beating the herbage and various undergrowth.

A still longer list of Noctuæ may be found, among which many

good species can be enumerated. Sugaring in July is often doubtful, in which case the collector must trust to his net to fill his boxes, but when it is good a numerous assemblage may be expected to the feast. Among others which I have taken I may enumerate *Cymatophora duplaris*, *Dicylea oo*, *Noctua augur*, *Hadena dentina*, *Leucania comma*, *N. c-nigrum*, *Aplecta nebulosa*, *Grammesia trilinea*. Both *C. duplaris* and *D. oo* I have found but sparingly of late years, but if sugar is tried frequently there is little doubt of success. *Dipterygia pinastris* comes to it in large numbers, and the same may be said of *Thyatira batis* and *T. derasa*, *N. brunnea*, *N. triangulum*, *N. plecta*, *N. rubi*, *Axylia putris*, *N. xanthographa*, *Tryphæna orbona*, *Apamea oculatea*, *Rusina tenebrosa*, *Euplexia lucipara*; *Cosmia affinis* and *C. diffinis* may be taken wherever the elm grows, and the best place in my experience is near Chingford Hatch. Around those parts of the Forest where there is much cultivation, *Agrotis segetum*, *A. exclamatoris*, *Xylophasia lithoxylea*, *A. corticea*, *Mania typica*, *Caradrina morpheus*, *Hadena oleracea*, *L. pallens*, *L. impura*, and *Mamestra persicariæ* may be found in any numbers. Among the *Miana* family may be found in great variety *M. strigilis*, *M. fasciuncula*, *M. furuncula*, and on the grassy fields between Chingford and "The Owl" may be found *M. arcuosa* in plenty. In damp marshy places, almost everywhere in the Forest, may be found *Nonagria despecta*, *Amphipyra pyramidea*, *X. hepatica*, *Tryphena fimbria*, and *Amphipyra tragopogonis* may be obtained almost anywhere, and *Acronycta megacephala* wherever there is a growth of poplar.

A trip to Wanstead Flats about the middle of the month would ensure *Hadena pisi*; *Hepialus sylvinus*, and its congener *H. hectus* can be taken, hovering over the ferns, in any quantity in all open parts. The larvæ of *Euchlidia mi* may also be found in plenty in that direction.

It will thus be seen that during July a great deal may be done, and with the increased facility for reaching the Forest afforded by the Great Eastern Railway, even those who live in London can manage to spend a summer's evening there after their day's work. I should be greatly pleased and repaid if this article should induce the younger entomologists to try this my favourite hunting-ground, and would wish to close with this remark—Do not catch an extravagant number of a good species, just because you have the opportunity, although exchange in moderation is a

legitimate way of increasing our collections. I know of many instances in which a good insect has been exterminated, which otherwise (but for the greed of a few) might still be fairly plentiful in its old haunts.

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INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. III.—CRYPTIDÆ (*continued*).

CECIDONOMUS, *Bridgm.*

Black, greater part of legs red; aculeus as long as the abdomen (male and female).

- * Wings with an areolet. - - - - *westoni*, 2—3 lines.
- ** Wings without an areolet. - - - - *gallicola*, 2—3 lines.

Described at Entom. xiii. 264–5; and for their affinities and economy see Entom. xiii. 254. Dr. Capron has since taken a specimen of *C. westoni* at Shere. *C. ? rufus*, Bridgm., is a synonym of *Hemiteles inimicus*, Gr.

ORTHOPELMA, *Tasch.*

Segments 2nd and 3rd brown-marked, front legs partly red, base of hind tibiæ testaceous; aculeus half or one-third of abdomen (male and female). - - - - 1. *luteolator*, 2—2½ lines.

This species is the common parasite of *Rhodites rosæ*, and may generally be bred from the rose bedeguar galls in May and June of the second year. We have also bred varieties from the galls of *R. eglanteriæ* and *R. rosarum*, but not commonly.

CATALYTUS, *Foerst.*

Base of antennæ, prothorax, scutellum, middle of abdomen and legs, red (male and female). - - - - 1. *fulveolatus*, 1½—2 lines.

Recorded by Marshall as doubtfully British. Mr. Bridgman has taken a short-winged female and a male with almost fully-developed wings near Norwich, and Mr. E. A. Butler captured a fine female at Battle last year. See Bridgman's remarks under "Aptesis Foersteri" (Trans. Ent. Soc. Lond., 1882, p. 146; 1883, p. 161).

CREMNODES, *Foerst.*

Stramineous, head and apex of antennæ black, apex of abdomen fuscous, 1st segment linear (female). 1. *atricapillus*, $\frac{2}{3}$ — $\frac{4}{5}$ line.

This distinct species is not uncommon in Britain.

STIBEUTES, *Foerst.*

A. Prothorax and mesothorax more or less red, legs and base of antennæ red (females).

a. Apex of 1st segment and 2nd entirely red; aculeus rather more than one-fourth of abdomen. 1. *gravenhorstii*, $1\frac{1}{2}$ lines.

b. 2nd and 3rd segments reddish yellow, the latter with a brown band; aculeus scarcely shorter than the 1st segment.

2. *bonellii*, $1\frac{1}{2}$ line.

B. Thorax black, abdomen chestnut-brown, lighter or darker; aculeus as long as the 1st segment (female). *heinemanni*, $1\frac{1}{2}$ line.

The species of this genus are generally rare, and nothing is known of their economy. Dr. Capron has taken *S. heinemanni* at Shere (Entom. xii. 15); only *S. bonellii* was included in Marshall's 1870 'Catalogus.'

AGROTHEREUTES, *Foerst.*

A. Thorax red; legs nearly entirely red (females). 2. *hopei*, 2—3 lines.

B. Thorax black, or almost entirely so; legs red (females).

a. Scutellum red. 1. *abbreviator*, $2\frac{1}{2}$ — $2\frac{3}{4}$ lines.

b. Scutellum black. *batavus*, $2\frac{1}{2}$ lines.

These are probably varieties of one species; all, together with another doubtful species (*A. destitutus*, Voll.), are well figured in 'Pinacographia' (pl. 37, figs. 1-4); they are probably subapterous females of various known winged male *Crypti*. Marshall records a full-winged specimen of *A. abbreviator* from Corsica (Ent. Mo. Mag. viii. 162). Thomson says that *A. abbreviator* is the female of *Cryptus pygoleucus*, uniting them under the name *Spilocryptus dispar* (Opusc. Ent., p. 505); but whether he had any further proof than Marshall's strong inclination is not stated (cf. Ent. Mo. Mag., viii. 119). Brischke says the male is *Hemimachus albipennis*, Ratz., which was bred by Siebold from a *Psyche* case (Schrift. nat. Gesell. Danzig., iv. ii. 2; iv. iii. 201). Kriechbaumer bred the female from *Psyche fusca* (*calvella*). *A. hopei* is the common form in Britain; it is admirably figured by Curtis (B. E., pl. 536). Brischke bred it from *Psyche viciella*,* and

Snellen from *P. fusca*. *A. batavus*, Voll., was captured by the Rev. E. N. Bloomfield at Guestling, near Hastings (Trans. Ent. Soc. Lond., 1881, p. 154).

APTESIS, *Foerst.*

- A. Base and apex of abdomen red (female). 1. *nigrocincta*, 2—3 lines.
 B. Apex of abdomen not red (female).
 a. Antennæ bicoloured (red and black).
 * 2nd and 3rd abdominal segments red. - 2. *hemiptera*, 2 lines.
 ** Apex of 1st and 2nd segments entirely testaceous, remainder brownish. - 5. *stenoptera*, 1½ line.
 b. Antennæ tricoloured.
 * 2nd and 3rd abdominal segments red.
 † 1st segment black, apical margin red. 3. *microptera*, 2—2¾ lines.
 †† 1st segment entirely red.
 † Mesothorax red, with a round black mark on the back.
 4. *brachyptera*, 2 lines.
 †† Mesothorax entirely red. - - - *vestigialis*, almost 2 lines.
 ** Abdomen rather piceous; apex of 1st segment and disc of 2nd more or less pale. - - - 6. *graviceps*, 1 line.

A. vestigialis, Foerst., is added to the six species included in Marshall's Catalogue; we have a specimen bred by Mr. Champion from the case of *Coleophora solitariella*. Three species of the genus are not rare, but are likely to be generally overlooked, as, when running over low herbage or on the ground, they bear considerable resemblance to certain ants and *Staphilini*. *A. microptera* has been found in the nest of *Formica rufa* (Ent. Ann., 1861, p. 41). Here, as in the other closely-allied genera, the hemipterous form is not constant; fully-winged specimens of *A. hemiptera* are not uncommon. Further research will not unlikely prove them to be subapterous varieties of the common *Phygadeuon fumator*, or a close ally (cf. Ent. Mo. Mag. v. 157; and Trans. Ent. Soc. Lond., 1881, p. 151). Marshall records *A. nigrocincta*, Gr., bred from *Hybernia defoliaria*.

ORESBIUS, *Marshall.*

Reddish brown, front part of head and metathorax black; aculeus as long as the 1st segment (female). - *castaneus*, 2—3½ lines.

This fine species is described and figured by the Rev. T. A. Marshall, at Ent. Mo. Mag. iii. 194, from two specimens taken at the top of a mountain (3500 feet) near Rannoch. Dr. Sharp captured one on Goatfell, Arran (2866 feet).

THEROSCOPIUS, Foerst.

A. Antennæ bicoloured, base red, apex black (females).

a. 1st abdominal segment with very projecting spiracles.

Base of antennæ, back of metathorax, apex of 1st segment, 2nd and 3rd entirely, and legs, red-yellow. - 1. *ingrediens*, $1\frac{2}{3}$ line.

b. 1st segment without or with very slightly projecting spiracles.

* 1st and 2nd abdominal segments aciculate.

Thorax, three first abdominal segments and legs more or less red.

† 2nd segment with a brown dorsal mark in front of the apex.

4. *inæqualis*, $1\frac{2}{3}$ line.

†† 2nd segment entirely red; almost the whole of this segment aciculate. - 2. *essenbeckii*, almost 2 lines.

** The 1st segment only aciculate.

‡ Scutellum red; middle of abdomen and legs red.

3. *subzonatus*, $1\frac{1}{4}$ line.

†† Scutellum black; middle of abdomen and legs red.

5. *pedestris*, 2 lines.

B. Antennæ entirely dark (female).

Almost entirely brownish black; legs brownish red; aculeus about half of abdomen. - - - - - *niger*, $2\frac{1}{2}$ lines.

T. niger, Bridgm., is described at Trans. Ent. Soc. Lond., 1883, p. 152, from a specimen taken by Mr. Cameron at Kingussie. The unsatisfactory definitions of the genera of these interesting brachypterous female Cryptidæ are there commented upon; also compare Ent. Mo. Mag. v. 155. *T. pedestris* is figured by Tappes (Ann. Soc. Ent. France, 4th ser., vol. ix., pl. i., fig. 15) from a specimen bred by Rosenhauer from the case of *Cryptocephalus 12-punctatus*. In Vollenhoven's 'Pinacographia,' *T. cingulatus*, Foerst., *T. essenbeckii* and *T. pedestris* are beautifully figured, with details (*l. c.*, pl. 37, figs. 5-7). All the species of *Theroscopus*, whose economy is known, are doubtless hyperparasitic, as Ratzeburg distinctly states that he bred his *T. gravenhorstii* from the cocoon of *Ophion merdarius*, Gr., which was parasitic on *Trachea piniperda* (Die Ichn. i. 154). Giraud bred *T. inæqualis*, Foerst., from the galls of *Diastrophus scabiosæ*.* Hartig bred *T. pedestris*, Fabr., from *Microgaster* cocoons parasitic on *Lasiocampa pini*.* This species has also been bred from the following varied hosts:—*Psyche opacella* by Brischke, *Psyche calvella* and *Fumea intermediella* by Siebold, *Cryptocephalus 12-punctatus** by Rosenhauer, and *Hypera plantaginis* by Schrank.

THAUMATOTYPUS, *Foerst.*

Piceous, abdomen paler; legs piceo-stramineous. - *billupsii*, 1 line.

See Trans. Ent. Soc. Lond., 1882, p. 145.

HEMIMACHUS, *Ratz.* = PEZOMACHUS (males).

I. Neuration of wings as in Hemiteles.

- A. Abdomen more or less red, or marked with red.
- a. Thorax more or less marked with red.
- * Wings with distinct, but faint smoky clouds. *rufotinctus*, $2\frac{1}{2}$ lines.
- ** Wings very clear, without any trace of colour. *albipennis*, 2 lines.
- b. Thorax not red-marked (except a little red on the collar sometimes).
- * Legs almost entirely red.
- † Coxæ red, hind one occasionally stained with brown.
- † Post-petiole quadrate; spiracles of 1st abdominal segment very prominent.
- Base of antennæ, middle of abdomen and legs red. *ovatus*, $2\frac{1}{2}$ lines.
- †† Post-petiole elongate.
- § Base of antennæ red.
- Legs entirely red; collar red, or red-marked.
- × Metathorax with posterior transverse line.
- o 3rd segment of abdomen black. - *hyponomeutæ*, $2\frac{1}{2}$ lines.
- oo 3rd segment more or less red. - - - *rufipes*, 2 lines.
- × × Supero-medial area faintly defined.
- §§ Antennæ black. - - - - - 3. *fasciatus*, $1\frac{3}{4}$ line.
- †† Hind coxæ black; apex of 1st and margins of 2nd segment of abdomen yellow-red.
- Supero-medial area of metathorax transverse. - *zonatus*, $2\frac{1}{2}$ lines.
- ** Greater part of hind legs black.
- Coxæ, especially the hind ones, black; abdomen elongate.
- Incisions of 1st and 2nd segments distinctly red.
- ++ Metathorax short, with only the posterior transverse ridge, and that obsolete in the middle. - - - *confusus*, $1\frac{3}{4}$ —2 lines.
- ++++ Metathorax of ordinary length, with indications of a supero-medial area, subquadrate or elongate, more or less distinct.
- rufocinctus*, Ratzeburg, $1\frac{1}{2}$ —2 lines.
- + Coxæ red. - - - - - *vagans*, $1\frac{1}{2}$ line.
- B. Abdomen black.
- Greater part of legs piceous red. - - - *piceus*, $2\frac{1}{2}$ lines.

II. Neuration of wings imperfect beyond the outer transverse cubital nervure; insect more or less pale piceous, head black.

A. Head much larger than the thorax.

annulicornis, Marshall MS. ? = *juvenilis*, 1 line.

B. Head of normal size. - - - *anthracinus*, $1\frac{1}{2}$ line.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLLECTING IN SURREY.—Accompanied by Mr. W. H. Wright I went, during the second week in June, into the western portion of Surrey, where heather and fir obtain to such an extent that in places one might easily imagine oneself again on the Highland mountains. Very different, however, was the result of a couple of days' stay in this neighbourhood to the numerous catches I had used to take with similar surroundings in Perthshire. One would hardly have believed it possible to have worked steadily, as we did, during the period we were there with such scanty results. The season is undoubtedly singularly backward, which may to some extent account for our ill-luck. On the evening of our arrival we sugared a most likely-looking locality on the edge of a large fir wood, and adjoining a fine tract of heather, with some amount of cultivation near. Having sugared about a hundred trees we amused ourselves by searching for moths which should, under ordinary circumstances, be found at rest on the trunks of the firs; but with the exception of a few *Scoparia ambigualis* and a single *Macaria liturata* nothing was found. Later on at sugar one *Tinea finistrella* and one *Agrotis exclamationis* were the only representatives of the great order Lepidoptera. Such bad success has seldom fallen to our lot, and considering that the evening was everything to be desired, viz. dull and warm, I can only attribute the scarcity of species either to the backwardness of the season or to the bad series of years which we have had lately. We can but infer that the moths have become partially exterminated, or that they have not had time to recover their normal numbers. On the wing almost as few species appeared, and even *Fidonia atomaria* was but thinly represented. *Emmelesia albulata* and *Thera variata* appeared, but in small numbers, as did also *Pterophorus polydactyla*, the latter looking very little the worse for its hybernation. *Xylophasia rurea* was represented by half a dozen specimens; and the small Geometræ, such as *Iodis lactearia*, *Panagra petraria*, *Heliothis marginata*, and *Eupithecia nanata*, were few and far between. In fact nothing in the evening can only be said to have been a total failure, as twenty minutes sometimes elapsed without seeing a single specimen. The species taken of exceptional interest were *Lobophora*

sexalata and *Aspilates strigillaria*, and a curiously marked odd-sided specimen of *Melanippe subtristata*, on which all the markings on one side were blended into a series of fine lines, which at first sight appeared to be an effacement of the scales. During the hot sunshine of the second day *Fidonia atomaria* was the only species found among the heather, while *F. piniaria* was to be seen flitting around the fir trees, being the only moth which appeared in anything like abundance. The second night's sugaring was nearly as blank as the previous one, half a dozen moths of the species already enumerated only appearing, with the addition of *Phlogophora meticulosa* and a single specimen of *Agrotis porphyrea*.—JOHN T. CARRINGTON; Royal Aquarium, June 24, 1883.

LEPIDOPTERA IN THE NORTH OF ENGLAND.—We find Lepidoptera exceedingly scarce this season in the North, the commoner species in some instances being quite absent. I recently sugared near Penrith, but with very poor success, three or four *Xylophasia rurea* alone appearing in one evening. The weather has been very cold, but it is to be hoped that the latter part of the season will be more profitable for the entomologist.—W. PREST; Holgate Road, York.

LEPIDOPTERA NEAR EDINBURGH.—Having seen in the 'Entomologist' accounts from different parts of the country, all, with one or two exceptions, complaining of the general scarcity of Lepidoptera, I thought that a few notes on the insects taken last year in this locality might be of some interest. Diurni were very scarce, the following only being taken, viz. *Pieris brassicæ*, *P. rapæ*, *Vanessa urticæ*, and *V. atalanta*. Moths were more numerous, both in numbers and species. Of Bombyces 4 species were taken, of Geometers 11, Noctuæ 30, and a number of Micro-Lepidoptera. At sugar *Leucania conigera*, *L. pallens*, *Miana literosa*, and *Plusia pulchrina*, were fairly common; *Triphæna pronuba*, *Xylophasia polyodon* (a perfect nuisance), and *P. gamma*, came in crowds; *Caradrina cubicularis* and *Apamea oculea* were also common. These, with a specimen each of *Hecatera serena* and *Heliophobus popularis* (bred), were the best insects taken. Two Geometers only were common, viz. *Camptogramma bilineata* and *Pelurga comitata*. In the garden were taken larvæ of the following species:—*Pieris rapæ*, *Mamestra brassicæ*, and *Hadena oleracea*, on cabbage; *Chelonia*

caja, on apple; *Acronycta psi*, on apple, pear, cherry, and hawthorn; *Rumia crategata*, on apple; and *Phlogophora meticulosa*, on plum.—A. E. J. CARTER; Joppa, N.B., May 22, 1883.

LEPIDOPTERA NEAR WINCHESTER.—It may be of interest to note the fact that the variety *valezina* of *Argynnis paphia* was taken here last year. A white variety of *Polyommatus phleas* was taken at the same time. As regards last season at Winchester, we seem to have been more fortunate than many other districts. *Argynnis euphrosyne*, *A. selene*, *A. paphia*, *A. adippe*, *Lymanitis sibylla*, *Hipparchia semele*, occurred in plenty. *Nemeobius lucina* and *Lycæna alsus* occurred less commonly, while *Thecla quercus* was extremely plentiful. *Apatura iris* was seen, but not taken. Among Heterocera—*Smerinthus populi*, *Zygæna filipendulæ*, *Lithosia rubricollis*, *Callimorpha dominula*, *Chelonia plantaginis*, *Rumia crategata*, *Euclidia mi*, *E. glyphica*, *Pygæra bucephala*, *Apamea oculea*, *Cidaria fulvata*, &c., were common. Other captures were *Chærocampa porcellus*, *Liparis monacha*, *Boarmia roboraria*, *Eurymene dolabraria*, *Arctia mendica*, *Lasiocampa quercifolia*, *Orgyia pudibunda*, *Geometra papilionaria*, *Cidaria picata*, *Anaitis plagiata*, *Dicranura vinula*, *Phlogophora meticulosa*, *Anarta myrtilli*, &c. I have been unable to get information as to most of the Noctuæ.—B. TOMLIN; The College, Winchester, May, 1883.

VARIETY OF *HEPIALUS LUPULINUS*.—On May 24th I captured the following variety of *H. lupulinus*:—The fore wings are white, with a broad tawny border on the costal margin; there is a band of the same colour on the outer and hind margins, but not so broad as that on the costal margin. The moth very much resembles the male *H. humulus*, except that the size is that of *H. lupulinus*: the hind wings are smoke-coloured, and the borders round the wings, which in *H. humulus* are very narrow, are in this specimen much broader, that on the costal margin occupying almost a third of the breadth of the whole wing; the head and thorax are tawny, as in *H. humulus*. The specimen was taken at the foot of a concrete and plaster wall, having recently emerged from the pupa, and affords a good instance of that faculty of protective resemblance so common amongst insects.—GEO. F. ADAMSON; Mavis Bank, Croydon.

ABUNDANCE OF *ODONESTIS POTATORIA*.—I have noticed that there has been an unusual abundance of the larvæ of *Odonestis*

potatoria this spring, in this neighbourhood. I should like to know whether this is owing to the mild winter.—A. SAKER; Stoat's Nest, Coulsdon, Surrey.

[There is little doubt that the mild winter has had much to do with the abundance of *O. potatoria*, which appears to be general.—ED.]

ERASTRIA VENUSTULA.—In the year 1860 I had a number of eggs of this species laid by a pill-boxed female taken in Epping Forest. These hatched in due course, and fed up freely on the flowers of *Tormentilla reptans*. Unfortunately I made no notes at the time, but as far as I can remember the only trouble I had with them was to get them fresh food. When nearly full-fed I gave some to the late Mr. E. Newman for description. My larvæ were kept in a well ground jam-pot, from which there was no possibility of escape; but day by day they "grew small by degrees and beautifully less," until there was one only left. This "last of the Mohicans" constructed a small cocoon just beneath the surface of some dry sand I had placed in the jar, and emerged the following May a small but bright-coloured specimen. The cocoon and pupa-skin I mounted on card, and gave them to Mr. Newman. It did not strike me until too late that they were of cannibalistic proclivities; and I should imagine that in a state of nature they gave each other a wide berth, and for that reason would, I think, be very hard to find by searching for, as the food-plant, *T. reptans*, is so widely distributed where they occur.—C. S. BIGGS; 3, Stanley Terrace, West Ham Park, E., June 20.

FOOD-PLANT OF ERASTRIA VENUSTULA.—There is, I think, very little doubt about *Potentilla tormentilla* being the natural food-plant of *E. venustula*. This moth was first bred in England in the year 1859-60 by my friend Mr. Henry Nicholls, who captured some specimens in the old Epping locality, which laid some eggs in the pill-boxes in which he carried them home. As nothing was then known regarding the life-history of the insect, and wishing to breed it, he was obliged to resort to the usual practice of collecting those prominent plants growing in the vicinity of the insect's habitat. As *P. tormentilla* was one of the most conspicuously common plants there it was selected, with many others, for trial. From those offered to it, it was found that the young larvæ selected *P. tormentilla*, and of that the flowers

only. This food was of course afterwards supplied to them exclusively, and on it Mr. Nicholls reared the first bred example in this country. I, too, some years after, viz. in 1877, successfully bred the insect from eggs which I obtained from the St. Leonard's locality. I fed them, likewise, on the flowers of the above-named plant until they were nearly full-fed. Leaving home about this time for four weeks, at Deal I found it inconvenient to get this food, and substituted the flowers of *P. anserina* and those of bramble, both of which they took to readily, and in due time pupated, and five specimens emerged. Of course bramble grows quite as plentifully at Epping as at St. Leonards, yet I am quite of opinion that *P. tormentilla* is their natural food. That Mr. Scott should have failed to find any larvæ feeding upon it is not surprising, for when they are young they are most difficult to see, and that even when you are certain that they are there. Even when full-fed they are easily overlooked, for then they have a habit of falling to the ground upon the least disturbance, where their colour renders them most difficult of detection. The plant being of such a short growth makes it almost impossible to beat for them, and to search will be indeed a work of patience. —W. H. TUGWELL; Greenwich.

FOOD PLANT OF ERASTRIA VENUSTULA.—Dr. Rössler, in his 'List of the Lepidoptera of Nassau' (1866), states, that according to Lederer the larva feeds on the bramble, *Rubus fruticosi*. Both the genera, *Rubus* and *Tormentilla*, belong to the order *Rosaceæ*, which may account for the fact of the larva of *Erastria venustula* feeding on *T. reptans*, when supplied with the plant in captivity, although *R. fruticosus* may be its natural food-plant.—ALFRED SICH: Burlington Lane, Chiswick, June 22, 1883.

TORTRICES IN MAY.—On Easter Monday I took a ramble through the woods near Maidstone, but saw no insects, either on the trunks of the trees or on the wing, but I succeeded in finding some pupæ of *Retinia turionana* in the centre shoots of *Pinus sylvestris*, from which I reared sixteen specimens; they emerged towards the end of April and early in May. I was pleased to meet with this species again, having searched for it in vain for many years past. In April last I collected a quantity of the stems of *Stachys sylvatica* in Epping Forest, from which I bred eighteen beautiful specimens of *Ephippiphora nigricostana* in May. *Pyrodes rhediana* was tolerably common on Fair Mead

Bottom, Epping Forest, in the middle of May. I secured about three dozen in a short time by beating the hawthorn.—WM. MACHIN; 22, Argyle Road, Carlton Square, E., June 20, 1883.

WOOD-BORING COLEOPTERA.—E. A. Schwarz, of Washington, makes the following observations in the 'American Naturalist':—“There are many Coleoptera of various families which live in the galleries made by other species in the hard wood of trees. Thus the galleries of *Mallodon* and other large Cerambycidæ form the home of many other species after the original owner has left them. If these inquilines are much smaller than the maker of the gallery, there is, of course, no difficulty in recognizing them as inquilines that did not make the gallery themselves. If, however, they are nearly of the same size as the original burrower, it is difficult to decide whether or not the galleries they inhabit have been made by them. Thus Mr. Eichhoff, in his excellent work on European Scolytidæ, suspects that the genus *Platypus* uses the galleries made by other beetles. My own experience in the South, with the common *Platypus compositus* is as follows:—When found in the thick bark of pine stumps the larvæ doubtless bore themselves, as there is no other beetle found in their company which makes such smooth and straight galleries. If, however, they occur in hard wood, such as oak, hickory, hackberry, &c., the case appears to be different, and seems to confirm Mr. Eichhoff's statement, as I found them always associated with true boring insects, viz., *Colydium lineola* and *Sosylus costatus*. The galleries of these three species are undistinguishable, and it appears to me very probable that *Platypus* simply uses the old galleries made by the two Colydiid beetles just mentioned. The Histerid genus *Teretrius* is another instance of this sort where the inquiline can be readily mistaken for the maker of the gallery, but in this case the *Teretrius* is simply parasitic on *Ptilinus* and other boring insects. I would also call attention to the fact that Professor Riley discovered the larva of *Hemirhipus fascicularis* to be parasitic on *Cyllene picta*, in whose galleries it was living. As the two species are of about the same size, the *Hemirhipus* might be taken for a true wood-borer. Another observation bearing upon this subject I had recently occasion to make in a street in Washington, D. C. There was an old maple tree perforated on one side with numerous holes, made, I presume, by an *Elaphidion* or some other average-sized Cerambycid. The

burrows had evidently long since been deserted by the original makers, but I saw protruding from four or five of them the heads of *Strongylium tenuicolle*. Upon investigation I found that the beetles had died in the vain effort to escape from the gallery, the entrance being much too small to let the body pass through. Now I know by experience that *Strongylium* is not a true boring insect, and lives only in the very soft wood of decaying trees, especially of oak. It appears to me probable, therefore, that the parent *Strongylium* had laid eggs at the entrance of a gallery made by a species smaller than itself, and that this mistaken instinct resulted in the death of its progeny in the manner just described."

APANTELES FRATERNUS Rhd.—It may be interesting to the readers of this Magazine to know something of this new British species. I bred it on the 20th September, from *Aspilates citraria*. The cocoons are formed on the same plan as those of *Microplitis alvearia* (Entom. xiii. 244), and the larvæ protected them in the same manner. After the escape of the flies I removed a thin slice, with a sharp knife, from one side of the batch of cocoons, to enable me to see how the cocoons were placed; the bottom consisted of eight, and eight were resting on these; the others above were not in such regular order, from the circumstance that eight appeared to have been placed in the second tier instead of seven; the batch consisted of twenty-seven cocoons; those in the centre were more or less pentagonal, and in general appearance looked like a piece of miniature honeycomb; the nest of cocoons was 7 mm. in length and $2\frac{1}{2}$ in height. *Microgaster flavipes* forms a similar cocoon and infests *Boarmia repandata*. It would be interesting to record what others pupate in this manner.—G. C. BIGNELL; Stonehouse, Devon.

[Of this species Dr. Reinhard says (Berl. Ent. Zeits. xxv. 47), "the yellowish white cocoons, to the number of 100 or upwards, are spun together in the form of a honeycomb in a very neat manner, with the long base of the comb attached to a thin twig or stem. There are many specimens of these cocoons in the Vienna Zoological Museum, collected by Rogenhofer in the neighbourhood of Vienna, from which this species had emerged. The holes in the cocoons from which the imagos had emerged occurred partly on the upper side of the comb and partly on the under side. The host, in which this *Apanteles* larva was

parasitic, is unknown. A similar arrangement of the cocoons occurs in *Microgaster alvearius*, Spin., and *M. flavipes*, Hal. (cf. Ruthe, Berl. Ent. Zeits. iv. 153), and in the *Ichn.* (*Microgaster*?) *alvearifex* described by Schrank (Enum. ins. Austr. p. 378). Réaumur was also familiar with similar cocoons, which he has described and figured (Mém. II. ii 233; pl. 37, figs. 7, 8). Of *M. flavipes*, Hal., Brischke says, "bred from the larvæ of *Boarmia repandaria* and *viduaria*. Cocoons whitish grey, with the long side regularly stuck together, spun round with brownish grey wool, mostly in the shape of a small half cheese;" and of *A. fraternus*, Rhd., "cocoons as in *M. flavipes*, but lighter." (Schrift nat. Gesel. Danzig v. iii. 131-2). *Microgaster minutus*, Rhd., commonly parasitic on *Cleora glabraria*, has a similar arrangement of its cocoons.—E. A. F.]

VISITORS TO RAGWORT BLOOM.—The following list of insects, &c., noticed on the flowers of ragwort last autumn, when searching for Lepidoptera after nightfall, may be of interest to naturalists. Of Diptera—Tipulæ, Culicidæ, Asilidæ, and other families. A few Coleoptera. Earwigs. Of Crustacea—woodlice, sand-fleas, and centipedes; one of the latter attacked a specimen of *Hydræcia nictitans* while I was watching. Also I met with a small newt and a fair sized frog perched on blossoms some 16 inches above the surface of the ground, having climbed up to so unusual a position in order no doubt, like several others in the above list, to prey on other visitors to the honeyed blossom.—J. D. V. KANE; Sloperton, Kingstown.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—A Pocket-Box Exhibition of specimens was held at the Society's rooms on Thursday, June 14th, to celebrate its Twenty-fifth Anniversary. A large number of members attended, and a considerable number and variety of species were exhibited, not only by the members but by the visitors. The excellence of some of the species exhibited tended to show that interest in the work was far from falling off, and that the season was up to the present fairly productive. Most noticeable among the exhibits were the Coleoptera of Messrs. Lewcock and Cripps, which represented a vast amount of patient labour. The same may be said, perhaps to a still higher degree, with respect to the preserved larvæ of Messrs. Franklin, Southey, and Raine. Over one hundred species were

shown, some of them very well done, and forming an exceedingly useful and instructive exhibit, and much calculated to further the cause of Entomology, as it is in this branch of the study that many of us are wanting in knowledge. Mr. Pearson exhibited specimens of Lepidoptera, Coleoptera, Neuroptera and Diptera, many of them of some considerable value. Among Lepidoptera the fine series of *Angerona prunaria*, shown by Mr. Hockett, containing four varieties, all of which were bred early in June this year, were worth seeing. Also *Erastria venustula*, captured on June 10th, this year. Mr. G. A. Clarke exhibited *Eupithecia jasionata*, *Pachnobia alpina*, *Agrotis cinerea*, and *Toxocampa craccæ*. A fine variety of *Tæniocampa munda* was exhibited by Mr. D. Pratt, and Mr. H. Bartlett showed a very fine series of *Clostera reclusa*, also *Cryptoblabes bistrigella* and *Eupithecia subumbrata*, and many others of lesser interest. Mr. Cartwright's fine specimen of *Notodonta trepida* was much admired. The same gentleman showed also *Stauropis fagi*, captured this year in Essex. Mr. May's *Diphthera orion* were very good, as also were his *Melanippe hastata*, equalled but hardly surpassed by those of Mr. W. Harper, among which were some nicely marked varieties. Also some *Amphydasis betularia* by the same exhibitor. The graceful setting of Mr. C. Boden's *T. gracilis*, *C. bistrigella*, *Epippiphora nigricostana*, and other species, coupled with a fine variety of *T. gracilis*, formed a very satisfactory exhibit. The *N. chaonia*, *D. furcula*, *M. hastata*, *Scotosia undulata* and others, shown by that indefatigable entomologist Mr. Henry Jobson, were looked upon with much favour, and were evidence of much patient labour. Other gentlemen, among whom were Messrs. Gates, Barry, Gurney, Sheldrake and Russell, also exhibited many species of more or less value.—R. G. BURRY.

EAST LONDON ENTOMOLOGICAL SOCIETY.—At a meeting of the East London Entomological Society, on the 13th June last, Mr. Upton, of 353, Southwark Park Road, exhibited a nearly full-fed larva of *Boletobia fuliginaria*, which will be more fully described on a future occasion. The same gentleman has captured several specimens of the perfect insect in former years, but this is the first occasion of discovering the habits of the larva, which he has succeeded in rearing to its present stage on a species of fungus.—D. PRATT; East London Entomological Society, 333, Mile End Road, June 19, 1883.

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VARIATIONS IN THE COLOUR OF LEPIDOPTERA.*

By J. JENNER WEIR, F.L.S., F.Z.S.

IN no order of insects has so much importance been attached by entomologists to the mere colouring of the species as in the Lepidoptera. The reason of this is not far to seek, for the wings of butterflies and moths are, as a rule, larger in proportion to the size of the body than is the case in any other order of insects; and further, the markings of the great majority are singularly invariable specifically, and the same character of markings obtains often over the whole of the genus, and even family, to which the species belongs.

Many of the species of butterflies are so constant in their markings and coloration that a variety, or even slight aberration, is rarely to be found. The common peacock butterfly, *Vanessa io*, is remarkably invariable in colour and markings; thousands might be taken before the most trifling deviation from the normal type could be found. This is true also of the red admiral, *Pyrameis atalanta*; the painted lady, *P. cardui*; and numerous other species.

On the other hand, particularly amongst the moths, some species are so truly polymorphic that it would be difficult to decide which coloration was the typical or normal one, scarcely two specimens being found to be absolutely similar. Two of the *Cidariæ*, for instance, viz., *Cidaria russata* and *C. immanata*, are very variable in their colours; and *Peronea cristana* has even a wider range of variation.

Within the limits of the word variety, as used amongst lepidopterists, several widely different conditions of variations of

* A paper read before the West Kent Natural History, Microscopical, and Photographic Society, 22nd November, 1882. Communicated by the author.

colour are embraced, and it is the object of this paper to classify these conditions, and to give greater precision to the use of the word.

Variations in the colour of Lepidoptera either from the normal type, or in the case of polymorphic species, from each other, may be placed under at least twelve different classes, and the table following will show the divisions under which I propose to deal with the subject.

TABLE OF VARIATIONS IN THE COLOUR OF LEPIDOPTERA.

Aberrations, or Heteromorphism.—White: Albinism. Pallid: Xanthism. Black: Melanism. Sports: Heteropœcilism. Females coloured as males: Gynandrochromism. Both sexes in one individual: Hermaphroditism.

Constant Variations, or Orthopœcilism.—Variable species: Polymorphism. Local variations: Topomorphism. Reversion: Atavism. Two static conditions: Dimorphism. Three static conditions: Trimorphism. Seasonal variation: Horeomorphism.

It will be seen from the table above that I divide the twelve classes into two sections, six classes in each. The first includes mere aberrations, and the second variations of constant occurrence. To the first section I give the name of Heteromorphism, and to the second that of Orthopœcilism.

The six heteromorphic variations are more of the nature of what gardeners call "sports," and in the natural state do not, as a rule, form permanent varieties or races, although by careful selection in confinement some of them may be perpetuated.

The six orthopœciliic variations are of constant occurrence, and in a state of nature form permanent variations either of a local, seasonal, or other character.

I do not contend that these twelve classes are sharply separated from each other, but, on the contrary, there are some variations to be met with that might with equal propriety be placed in more than one of the classes.

I shall now consider the twelve classes separately:—

ALBINISM.—A pure albino amongst the Lepidoptera is very rare, and my cabinet contains but one specimen, viz., *Eusebia bipunctaria*. This remarkable specimen I took myself at Lewes. The only other albinos I have seen were captured in the Island of Lewis, in the Outer Hebrides. They were so frequently met

with there, in the case of *Emmelesia albulata*, that I proposed for them the specific name of *Hebudium*. Partial albinism occurs not unfrequently in *Satyrus janira*, the colour being absent from one or more of the wings, producing white patches.

XANTHISM.—In this class I place all those aberrations of colour which assume a pallid appearance over the whole extent of the wings. I illustrate this condition by three remarkably light yellow varieties of *Cænonympha pamphilus*, one of *Satyrus semele*, one of *Cænonympha davus*, and one of *Polyommatus phleas*, and on the under side of *Satyrus hyperanthus*. Xanthism is also found occasionally in the genus *Anthrocera*, especially in *A. filipendulæ*, the spots on the wings being sometimes yellow instead of red. Many more instances of Xanthism might be given. The most remarkable case I ever saw was that of *Pyrameis cardui*, where the two wings on one side were normal, on the other xanthic.

MELANISM.—Pure melanism is rare amongst Lepidoptera, and I think it is found only in those species where black obtains in the markings, and it really consists in the diffusion of the black over the whole of the wings. I illustrate this condition by melanic specimens of *Biston betularia*. This, commonly called the peppered moth, has usually a white ground colour to the wings, with small black spots; but it has been found in the North of England entirely black, and I believe this melanic variety has been perpetuated in confinement by careful selection. I have seen almost melanic varieties of *Abraxas grossulariata*, and partial melanism is common in that species. Several of the Geometridæ and Noctuidæ are found more or less melanic in the northern parts of England and in Scotland. *Dianthæcia conspersa* is a good illustration of this darkening of colour in northern specimens; many, more or less suffused with black, have been captured.

HETEROPŒCILISM.—In this class I place mere sports, which may occur once or twice, and perhaps never be found again. I illustrate this by two specimens of *Satyrus hyperanthus* from the New Forest, one captured by myself. In these two insects the ordinary round spots on the under side of the wings are changed into lanceolate markings. I have also two specimens of *Cænonympha davus* with similar lanceolate, instead of round, markings, both on the upper and under side of the wings. The aberration

in the case of *S. hyperanthus* would probably be a disadvantage to the insect, as the usual round spots on the under side of the wings resemble very closely the oak spangles, so that the imago, when at rest with closed wings, would more easily escape being detected by birds.

GYNANDROCHROMISM.—In this class I place those aberrations in which, the two sexes being generally of different colours, the female is more or less of the colour of the male. *Odonestis potataria* is usually of a buff colour in the female, and dark brown in the male. I have a specimen in which the female is precisely of the colour of the male. This was taken in the New Forest, and I have seen many others. In the genus *Lycæna* the males of several species are blue, and the females brown or blackish. In specimens of the female of *Lycæna icarus*, of which I have a score or more in my cabinet, the females have the wings more or less of the blue colour usual in the male. This occurs also occasionally in *L. adonis* and *L. corydon*. This assumption by the female of the colour of the male is found in several species of Lepidoptera.

HERMAPHRODITISM.—I have found this a very rare condition of Lepidoptera, and have never taken one myself. When it does occur the wings and antennæ on one side are often coloured and formed exactly as in the male, and on the other side as in the female. It has been found in *Lycæna icarus*, in which case the peculiarity is very marked, as the wings on one side are blue and on the other brown. The insect indeed appears equally divided down the middle of the head, thorax, and body, into the two sexes. Hermaphroditism occurs also in varying proportions. I have observed it in *Satyrus semele*, and in some moths. It is found more frequently amongst hybrids, and has been observed in those between *Smerinthus populi* and *S. ocellatus*. Occasionally the wings of hermaphrodites appear as if quartered, the upper right wing and the lower left being of one sex, and the left upper and lower right *vice versa*.

I now pass on to the Orthopæciliæ sections:—

POLYMORPHISM.—The most remarkable species amongst the British Geometridæ illustrating this condition are the two allied *Cidariæ*, *Cidaria russata* and *C. immanata*. The variation is, I think, greatest in the former species. *C. russata* has the broad central bar of the upper wings either black, brown, red, or grey,

and in some cases nearly white. Specimens are occasionally found suffused almost entirely with black, and the relative proportions of the colours varies considerably. It would be impossible to say what is the normal colour in this species. I find that in the Outer Hebrides and in the Island of Arran the coloration is much more uniform, the general appearance of all the specimens being greyish. *C. immanata* varies in a similar manner, except that only in the Shetlandic specimens have I seen any tendency to red in the centre of the wing. *Peronea cristana* varies from almost black to nearly white, and the tufts in the wings vary in colour from black to red, yellow, or white. The same difference also obtains in the shoulder markings, and in the dashes on the inner edges of the wings. Several others of the *Peronea* differ in an equally remarkable manner amongst themselves, whilst one species, on the other hand, is very constant in colour in this country.

TOPOMORPHISM.—I place under this class all local variations. These may be sufficiently constant as to admit of being considered subspecific or racial; and in certain districts the variation appears to take place in response to the geological environment. In the British Isles the most remarkable topomorphic variation is that of *Hepialus humuli*. This species which, so far as I am aware of, in England and Scotland has a silvery coloured male, and a buff female with a few reddish markings; but in the Shetland Isles it appears to be subject to many variations, the colouring of the sexes being reversed, both in the case of males and females, and some varieties being more melanic; so that the *Hepialus humuli* of those islands has been raised to a subspecific rank, *Hethlandica*, by Staudinger; and as well as being topomorphic is also truly polymorphic. In the Outer Hebrides *Boarmia repandata* departs from the normal coloration of that species as found in England, viz., various shades of brown, to a prevailing slaty grey, with darker markings. To this well-defined topomorphic variation I have ventured to give the name of *Sodorensium*. As an instance of a topomorphic variety dependent apparently on the geological environment, I know of no better example than that of *Gnophos obscuraria*. This insect on the chalk downs, near Lewes, is found almost white with dark markings, and of a light grey ground colour with darker markings; but on the peaty soil of the New Forest I have taken it in plenty of a very dark grey colour, in

some instances nearly black. Specimens obtained in limestone districts are of a brownish grey colour.

ATAVISM.—In this class I place all variations which show a tendency to reversion to what I conceive to be a common ancestor. Of this I have a few illustrations in my cabinet, and singularly in that usually remarkably invariable species, *Vanessa io*. Several of the *Vanessidæ* have a row of blue spots on the margin of the wings; these are well seen in *Vanessa urticæ*, *V. polychloros*, *V. antiopa*, and several foreign species. In *V. io* the blue marginal spots appear to be concentrated in the under wings into two large circular patches; but by careful examination of specimens, taken by myself in the New Forest, I find some have on the lower wings small blue spots in the dark colour beyond these patches, which, to my mind, are evidently traces of the row of blue spots which in *Vanessa io* have become differently arranged. In the *Larentidæ*, a family commonly known as carpet-moths, the bulk of the species have a well-defined broad central bar; but this is more or less broken in some species, yet amongst them it is not unusual to find one with the centre bar well defined. This I take to be a case of reversion to the markings of a common ancestor. *Cidaria corylata* in the normal form has the bar interrupted; but I have a specimen in which it is as complete as is typical of the genus. In *Melanippe hastata* the bar is usually interrupted; but I have one in which the bar is complete. *Melanthia rubiginata* has usually only the commencement of the bar at the costal edge of the wings, but frequently traces of the obliterated bar are found on the inner edges of the wings.

DIMORPHISM.—In this class I place all those insects which have two well-defined types of colour, generally without intermediate variations being found. The best type of this class found in the British Isles is *Argynnis paphia*, and its dimorphic female form *Valezina*. In this case the normal coloration has red for the ground colour of all the wings, but in *Valezina* the ground colour is green. Although I have spent many days in the New Forest in the observation of this species, I have never found a female of this insect which is other than either *Argynnis paphia* or *A. valezina*, yet I have found a green shade somewhat pervading the female of the former to greater or less extent. In *Clisiocampa neustria* dimorphism is well pronounced. I have both males and females of a yellowish buff, and of a dark brown colour. *Colias*

edusa and *C. hyale* are both dimorphic in the female sex. Some of the females of the former are red and some yellow; and of the latter some are yellow and others white, or nearly so.

TRIMORPHISM.—Trimorphism in butterflies is not found in England, but attention has been drawn to it by Mr. A. Russel Wallace in the case of certain species of *Papilio* inhabiting the Austro- and Indo-Malayan Archipelago. *Papilio pammon*, *P. theseus*, and *P. ormenus*, are all trimorphic in the female sex.

HOMOMORPHISM.—In this class I place all those Lepidoptera which appear twice a year, and with such a difference in their coloration that in many cases they have been held to be distinct species. The best illustration of this, found in Great Britain, is *Pieris napi*: this insect appears in May and June, and again in July and August. The males of the spring emergence are almost white on the upper side, and the under sides of the secondary wings have their venations densely irrorated with dark grey. The females on the upper side have the venations of the wings densely irrorated with grey on a whitish ground, and the under sides strongly suffused with the same colour, denser at the sides of each venation. The males of the summer emergence have well-defined larger or smaller subapical black spots on the upper wings on a pure white ground, the sprinkling of grey near each venation on the under side being much less than in those of the spring emergence. The females have a pure white ground colour to all the wings on the upper side, and the venations are well defined with black edgings; on the under side the irrorations on the edges of the venations are very much less pronounced. It appears, from the researches of Dr. Weisman, that whether the insect presents the coloration of the spring or summer emergence depends entirely on the time it remains in the chrysalis. The butterflies which appear in spring have spent the winter in the chrysalis state; these lay eggs in June, which pass through all the stages of egg, caterpillar, and chrysalis states in a few weeks, appearing as perfect insects in the summer, but in the form of the summer emergence. Now Dr. Weisman has found that if the chrysalis, which in ordinary course would produce the summer emergence form, are prevented from developing by being placed for a sufficient time in the cold, say in an ice-safe, they appear with the coloration of those of the usual spring emergence, or, in other words, in nature, A produces B, B A, and so on; but

when thus retarded A produces A, entirely skipping B. The hypothesis of the learned Doctor was that both forms were descended from *Pieris bryoniae*, an alpine single-brooded form, which perhaps existed over Europe during the glacial period (this species is very much darker than even the British spring form of the insect); that, as the climate became ameliorated, the insect gradually acquired the double-brooded habit, and at the same time became seasonably dimorphic, or, as I term it, horeomorphic. He then proceeded to test the truth of this hypothesis by forcing the insect back to its old condition of single-broodedness, and with the result that the form, that of the summer emergence, least like *Pieris bryoniae*, was eliminated. All this is well set forth in Mr. Raphael Meldola's translation of the Doctor's work on this very interesting subject. Some of the British species of *Ephyra* and *Ennomos* amongst the moths, and of *Lycæna* and *Polyommatus* amongst the butterflies, are horeomorphic. *Ennomos illustraria* is horeomorphic; and it has been observed that out of one brood some of them will appear in the summer in the form of the summer emergence, whilst others remain in the pupa state all through the winter, and appear the next spring with the characteristics of those of the spring emergence. Other species of the genus *Ennomos* are equally marked in their horeomorphism. This is perhaps the most interesting of all the forms of variation to which I have adverted. It is known to occur in several European butterflies. *Araschnia prorsa* has its horeomorphic form *levana*, and its intermediate form *porima*. In America it occurs in a true *Papilio*. Mr. Edwards, in his 'North American Butterflies,' gives an account of exceedingly interesting results he had obtained in breeding this insect, known under the names of *Papilio ajax*, *P. telemonides*, and *P. marcellus*. This is a very complicated case, dimorphism and horeomorphism existing in the same species. Mr. Edwards uses the old name of *P. ajax* to include all the variations; *P. walshii*, and its subvariety *P. abbottii*, for the spring emergence, and retains the name of *P. telemonides* for the intermediate form, and that of *P. marcellus* for those of the summer emergence.

In conclusion I have to add that in each of the classes I could have given many more instances of the different conditions of variation, but I have restricted myself to a few cases only, which I deem sufficiently marked to illustrate the subject.

MEMORANDA ON INSECTS IN THEIR RELATION TO FLOWERS.

By ROBERT MILLER CHRISTY.

(Concluded from p. 150.)

39.—June 5, 1882. A garden at Chignal. Watched the movements of a small and very undecided humble-bee. First it hovered over a large *Mimulus*, then over 8 or 9 flowers of yellow *Nemophila*, about as many of musk, took a long flight, returned, hovered over *Nemophila*, took another flight and hovered over *Lonicera periclymenum*, returned and hovered again over *Nemophila*, then visited 4 flowers, afterwards hovering over *Mimulus*, musk, and double red rose.

40.—June 10, 1882. Garden at Writtle, near Chelmsford. A humble-bee was seen to visit several white flowers of *Digitalis purpurea*, which it left and went to red *Antirrhinum majus*, hesitated, left it, but returned directly and visited several flowers.

41.—Same date. Meadow at Chignal. A smallish black humble-bee, orange-red behind, visited *Trifolium pratense* twice, *Lotus corniculatus* once, *Trifolium pratense* again once, and was then lost. It passed over *Chrysanthemum leucanthemum*, a *Hieracium*, a small *Rumex*, *Stellaria media*, &c.

42.—June 12, 1882. Same place. A small striped humble-bee was seen to hover over, but reject, *Chrysanthemum leucanthemum* and *Trifolium pratense*, but afterwards to visit 12 heads of *Trifolium repens*, and then 11 of *Trifolium pratense*, afterwards being lost.

43.—June 20, 1882. A small striped humble-bee was seen to visit in the following order the flowers of *Digitalis purpurea*:—8 which were purple, 2 which were white and grew close by, and then 5 more of purple previously visited, avoiding other species around.

44.—July 3rd, 1882. Alpine Meadow, St. Moritz. A large black humble-bee striped with yellow visited *Phyteuma orbiculare* 8 times, and was then lost, having passed over, but not visited, *Veronica chamædrys*, *Chrysanthemum leucanthemum*, *Lychnis diurna*, *Ranunculus* (? sp.), a small chickweed, *Polygonum bistorta*, *Cerastium arvense*, *Trifolium pratense*, *T. repens*, &c.

45.—Same date and place. A smaller humble-bee, but otherwise much the same, visited *Lamium album* over 50 times, and was then lost. At the same spot grew abundantly *Viola lutea*, *Ranunculus* (? sp.), a large umbelliferous plant and a small *Stellaria*, *Polygonum bistorta*, and *Cerastium arvense*.

46.—July 4, 1882. Meadow at Pontresina, Engadin. A great many specimens of *Argynnis selene* frequented the meadows, and I noticed that they had an especial liking for settling on the heads of *Hieracium alpinum*, which is of a copper-colour, very much the same as the insects themselves. This may, perhaps, have been a case of "natural protection," but the object seemed also to suck the nectar. I disturbed one insect settled on a flower of the above plant, and it went immediately to another of the same species. This I did eight times, and on each occasion the insect alighted again on *Hieracium alpinum*, avoiding the other species that grew abundantly around.

47.—July 14, 1882. Meadows at Sils Maria, Engadin. To-day being very hot I had many opportunities of observing the same thing just spoken of. *Hieracium alpinum* grew plentifully, but mixed with a profusion of other flowers. It was frequented by various butterflies, such as blues, coppers, copper-coloured fritillaries (with, I think, several allied species), and the insects showed their preference for *Hieracium alpinum* by directly settling on it, although I immediately disturbed them no less than 5 or 6, or even 8, times.

48.—July 16, 1882. Bank at St. Moritz. A small humble-bee which I observed was diligently visiting both red and white flowers of a *Trifolium* (? *T. hybridum*), where both (apparently of the same species) grew intermixed, with many grades of pink between. It next paid one visit to *Gentiana campestris*, and flew away.

49.—July 19, 1882. Side of Alp Nova, St. Moritz. A very small humble-bee was watched on a place where *Lychnis rupestris* grew very abundantly with some umbelliferous plants, *Chrysanthemum leucanthemum*, *Achillea millefolium*, several *Hieracia*, *Helianthemum vulgare*, *Centaurea scabiosa*, *Viola lutea*, *Cerastium arvense*, and *Euphorbia cyparissias* in lesser abundance. The bee visited *Thymus acinos* 27 times, and was lost.

50.—Same date and place. A similar bee visited *Thymus acinos* 10 times, and was lost.

51.—Same date and place. A similar bee visited *T. acinos* 6 times, and was lost.

52.—Same date and place. A similar bee visited *T. acinos* 23 times, *Lychnis rupestris* once (this flower it happened to walk over), *T. acinos* 19 times, and was lost. This bee and the last three may have been the same one.

53.—Same date and place. Near the same spot a small humble-bee visited *Medicago sativa* 20 times, and was then lost, having passed over, but rejected, *Chrysanthemum leucanthemum*, *Helianthemum vulgare*, *Campanula* (? sp.), *Sanguisorba officinalis*, *Trifolium pratense*, *T. repens*, an umbelliferous plant, *Anthyllis vulneraria*, &c.

54.—July 22, 1882. Same place as obs. No. 49. A small striped bee visited *Thymus acinos* 86 times consecutively, then 1 *T. serpyllum*, 8 *T. acinos*, 1 *Centaurea scabiosa*, 37 *T. acinos*, and was afterwards lost, having avoided all the other flowers. Thus one bee paid 133 visits to three species of flower, one of which was blue and two purplish red. One species of thyme was visited 131 times, another once, and a species of *Centaurea* once.

55.—July 24, 1882. Same place. A moderate-sized totally black humble-bee visited *Thymus acinos* 34 times, and was then lost, it having avoided all the other flowers.

56.—July 26, 1882. Pine Forest, near St. Moritz. I watched a medium-sized humble bee pay 13 visits to *Geranium sylvaticum*, one to *Trifolium alpinum*, then 12 more to the *Geranium*, when I lost him. *Rosa alpina* and a few other flowers grew around.

57.—July 28, 1882. Same place as obs. No. 49. A good-sized black humble-bee visited *Thymus acinos* 86 times, *Medicago sativa* once, *T. acinos* 4, *Trifolium repens* 1 (then hesitated at, but rejected, *Medicago sativa*), and lastly paid two visits to *Gentiana*, being afterwards lost. This insect paid 94 visits to four species of flower, two of which were blue (visits numbered 90 and 2 respectively), one white (a single visit), and one reddish (also a single visit).

58.—July 31, 1882. The wide, dry, stony bed of the Surlej torrent covered with a profusion of flowers. Watched a smallish long-bodied striped humble-bee, which was visiting indifferently two somewhat nearly allied flowers, viz. *Oxytropis campestris* and *Trifolium repens*. It visited them alternately the following number of times, commencing with the former:—7, 5; 4, 2;

2, 1; 14, 6; 1, 7; 1, 2; 4, 2; 12 (*O. campestris*), and was lost. It thus paid 70 visits to these two species, *i. e.* 45 to the one, and 25 to the other. *Anthyllis vulneraria*, *Trifolium hybridum*?, more than one blue *Vicia*, several *Hieracia*, a *Campanula*, *Erigeron acris*, *Chrysanthemum leucanthemum*, *Achillea millefolium*, *Centaurea scabiosa*, &c., grew around.

59.—Same date and place. A specimen of *Colias hyale* visited *Hieracium pilosella* twice, a common yellow *Hieracium* three times (settled momentarily on *Anthyllis vulneraria*), then one more flower of the yellow *Hieracium*, and was lost. All these flowers were yellow, of one shade or another.

60.—Aug. 4, 1882. A flower-bed, Kurplaze, St. Moritz. An individual of *Argynnidæ*, viz. *A. aglaia*, visited *Thymus serpyllum* ten times, and was lost, having avoided *Thymus acinos*, *Solidago virgaurea*, *Sedum acre*, *Dianthus deltoides*, *Chrysanthemum leucanthemum*, &c.

61.—Aug. 5, 1882. Bank at St. Moritz. A medium-sized humble-bee visited *Carduus pratensis* five times and *Centaurea scabiosa* ten times (two composite flowers, both reddish purple and of the same general appearance), and was then lost, having avoided all else, though *Polygonum bistorta*, *Solidago virgaurea*, *Achillea millefolium*, *Epilobium angustifolium*, and some other flowers, grew plentifully on the same patch.

62.—Same date. Meadow at St. Moritz. A large fritillary, viz. *A. aglaia*, visited *Scabiosa succisa* twice, *Carduus pratensis* three times, and was lost. Only a few other flowers grew around.

63.—Aug. 7, 1882. Same place as obs. No. 49. A very small brisk bee visited *Thymus acinos* 28 times, *Medicago sativa* once, and was lost.

64.—Same date and place. A medium-sized bee, at work on the edge of the above flower-patch, visited *Echium vulgare* 21 times, having avoided all else. Plenty of the following flowers grew around:—*Centaurea scabiosa* and *Lychnis rupestris*, with some *Dianthus deltoides*, *Campanula pumila*, *Thymus serpyllum*, *Hieracium*, *Helianthemum vulgare*, *Thymus acinos*, &c.

65.—Same date and place. A bee of the same species paid five visits to *Centaurea scabiosa*, avoiding all beside.

66.—Same date and place. A slightly different bee visited *Centaurea scabiosa* 13 times, *Thymus acinos* 5, *C. scabiosa* 11, and was lost.

67.—Same date and place. Near the scene of the foregoing observation a moth, about twice the size of *Plusia gamma*, visited *Silene nutans* twice, *Centaurea scabiosa* once, and was lost.

68.—Aug. 14, 1882. Rocky slope, near St. Moritz. A smallish striped humble-bee paid forty-three consecutive visits to *Epilobium angustifolium*, and one to *Phyteuma orbiculare*, after which I lost him. Other flowers were not numerous around, but there were a few, such as *Sempervivum montanum*, *Solidago virgaurea*, *Campanula*, and a large umbelliferous plant.

69.—Same date and place. A bee of the same species paid twenty visits to *Epilobium angustifolium*, avoiding all else.

70.—Aug. 16, 1882. Steep rocky river-bank, near Falls of St. Moritz. A humble-bee was seen to visit *Epilobium angustifolium* thirty-four times, *Rubus idæus* once, and was lost.

71.—Aug. 19, 1882. Same place as obs. No. 68. A specimen of the Apollo butterfly paid four successive visits to *Carduus pratensis*, avoiding *Campanula*, *Solidago virgaurea*, *Scabiosa succisa*, *Dianthus deltoides*, *Achillea millefolium*, &c.

72.—Same date and place. A copper-coloured butterfly visited *Solidago virgaurea* three times, and was lost, after having hesitated at, but rejected, a plant of the same, a *Hieracium* and a *Potentilla* (twice), all these being yellow. Other flowers on the same spot were *Campanula* and *Silene* ?

73.—Aug. 22, 1882. Meadow at St. Moritz. An individual of *Argynnis lathonia* visited consecutively twenty-seven flowers of *Viola lutea*, taking, however, several considerable flights between some of the visits. Other flowers on the same patch were *Lychnis diurna*, a small *Veronica*, and a hop trefoil.

74.—Aug. 23, 1882. Mountain side over Roseg glacier. A medium-sized black humble-bee, yellowish behind, visited *Trifolium repens* twelve times, avoiding all else, though plenty of *Parnassia palustris* grew around, with some *Achillea millefolium*, *Hieracium*, *Aconitum napellus*, &c.

75.—Oct. 1, 1882. Garden at Chignal. A specimen of *Pieris brassicæ* visited one flower of scarlet *Geranium*, three of pink *Geranium*, took a flight, settled, returned, visited pink *Geranium* once, hesitated over *Petunia*, and lastly visited six more flowers of pink *Geranium*, having passed over plenty of scarlet *Geranium*, red *Papaver*, red and white *Antirrhinum*, asters, &c.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ENTOMOLOGICAL NOTES FROM CHICHESTER.—Although the year was early heralded by the gay music of the song thrushes (*Turdus musicus*), the furze was bright with golden blossoms, and little twigs of whitethorn (*Cratægus oxyacanthæ*) were in full leaf in a sheltered spot as early as the first week in January, the promise of an early spring and summer was not fulfilled; on the contrary, an exceedingly late season ensued, the hawthorn blossoms not being fully out till almost the last days of May. As with vegetation, so with insects; the few species that have hitherto appeared have been behind their usual time as much as a fortnight or three weeks; for instance, *Hepialus humuli*, which usually comes out about midsummer, was first seen by me on the 5th of July; some of the females, which I have taken here in damp ditches, are of good size and brightly coloured, differing considerably in these respects from specimens captured in fields and pastures. For several seasons now the lepidopterist has had to tell a tale of great scarcity of butterflies and moths, and the present one seems to be worse even than the preceding. However, it appears to be a rule that bad seasons should produce some particular insect in some abundance,—the more observed, it may be, on account of the paucity of others. At all events, during June, the pretty little clearwing, *Sesia tipuliformis*, was fairly common on currant and gooseberry bushes in most gardens, flitting in the sunshine like a little gnat, and resting for a few seconds on the leaves. I found the best way of securing them was to box them when thus settled, which I found to be a not very difficult task. Amongst the Sphingidæ I may mention *Sphinx ligustri*, *Chærocampa elpenor*, *Smerinthus populi*, *S. ocellatus*, and *S. tiliæ*, as those I have taken and set, the last named being of very dissimilar tints. One especially is noteworthy for an exquisitely lovely olive-green, which was bred from a dark variety of the larva found in July, 1882. Larvæ of *Leucoma salicis*, taken from poplars on June 20th, produced imagines in less than a month, the moths emerging on July 13th. All through May and June I was anxiously watching in my breeding-cage for *Stauropus fagi*: six eggs, laid by a melanic variety of the female, were sent me last year by a most kind friend. These in due time hatched and fed up, all six passing safely into the pupa

state; but from some unaccountable reason, to my great disappointment, not one of the moths came out. I should be very grateful if some one could suggest the cause of the failure, and give me any hints as to the management which would prevent a similar misfortune another time. I have now four little larvæ, hatched on the 7th of this month (July), which appear to be doing as well as one could desire. I fear that the conservatory into which I took the pupæ in May must have been too hot, causing them to dry up. The larvæ of *Halia wavararia* were in some gardens quite a nuisance, stripping the leaves of the gooseberry and currant bushes, and with the sawfly (*Nematus ribesii*) causing some injury to these useful fruits. *Acidalia incanata* has not failed to put in an appearance. I have not yet tried sugaring, having such bad accounts from my friends as to its being quite useless to do so; and the Noctuæ that I have seen have been of the commonest description, only such species as *Leucania pallens* and *L. impura*, *Hadena lithoxylea*, &c., being met with. As for the Diurni—with the exception of a few *Vanessa urticæ*, *V. atalanta*, and *V. cardui* (these last looking miserably worn and faded, as if they had seen two or three summers and winters), and some of the commoner “skippers”—this district, at least, has been almost without them. Thousands of larvæ, doubtless, perished in the disastrous salt-storm of April 29th of last year, and the present dearth of insects is not much to be wondered at. To these few notes I may add that the larvæ of a sawfly, found by me on *Veronica anagallis* last November,—some of which I fed up, and which Mr. Fitch, to whom I sent them for identification, thought might be *Athalia annulata*, Fabr.,—produced perfect insects during May, and prove to be that species.—JOSEPH ANDERSON, jun.; Alie Villa, Chichester, July 20, 1883.

ABBOT'S WOOD IN JULY.—During the first week in July I paid a visit to Abbot's Wood, where I had hoped to do some considerable collecting. Upon my arrival there I was surprised to find such a few species on the wing. The weather was all that could be desired: the sun shone brilliantly by day, and warm over-hanging clouds made the evenings look well for sugar. But the weather apparently had little to do with the scarcity; for if it requires sunshine and warmth to cause emergence from the pupa, there certainly was an abundance of both at that time. The only member of the Diurni on the wing of any exceptional interest was

Arge galathea, and that I must say was the most plentiful insect there, if I may except the flies, which latter were so pertinacious and swarmed in such multitudes as to make collecting a far more difficult task than can be imagined, as they took every opportunity of creeping into one's eyes, nose, mouth, &c., and in such numbers that I was ultimately obliged to retreat. *Melitæa athalia* was apparently over, as I saw but a few faded specimens, but it apparently had not been plentiful. Some of the more common butterflies were out in fair numbers, such as *Hesperia sylvanus*, *H. linea*, *Satyrus hyperanthus* and *S. janira*; but *Argynnis adippe*, which should swarm there, was hardly to be seen. Plenty of worn *Cynthia cardui* were flying over the thistle-heads, which promises a goodly number of them for September. The Geometræ on the wing were not numerous; the only species at all plentiful were *Timandra amataria*, *Cidaria fulvata*, and *Tanagra chærophyllata*. A few *Angerona prunaria* were seen, but not in any degree plentiful. At sugar nothing beyond the very commonest insects put in an appearance; and the White Field being in the possession of a herd of oxen, and most of the trees having been cut down, rendered sugaring by oneself anything but pleasant. Although Noctuæ would not come to sugar, yet there were a few upon the wing, among which I noticed *Plusia chrysitis* and *P. iota*, but by no means so many as the time and weather should warrant. I should like to hear any opinions about such scarcity as appears to prevail, particularly as the foliage of all the trees has come out in more than usual luxuriance, and forms quite a contrast with the scantiness of last year.—J. P. WHINSTONE; Pevensey Road, Eastbourne, July 14, 1883.

ABBOT'S WOOD.—Having just returned from a visit to this locality, in company with the Rev. E. C. Dobree Fox, I should like to caution any of your readers who may be thinking of going there this year,—first, that the White Field is no longer available for sugaring, most of the trees having been cut down, and the field occupied by a herd of cattle; and secondly, that sugar in that locality was this year an utter and ludicrous failure, only three good insects having fallen to our lot during the whole fortnight, and even the commonest species being for the most part conspicuous by their absence. I hope to give more details in a future number.—(Rev.) CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, July 23, 1883.

NEW FOREST IN JULY.—The month of July being the most lively, and generally considered the most productive, I determined to pay a visit with a friend to the New Forest about the 14th. Having visited it previously with excellent success, I built many “castles in the air” during the journey down, and the visions of good things about to be captured both on sugar and on the wing made me feel light-hearted upon my arrival. Notwithstanding the fact that a resident informed us that things were scarce, I set to work with a will, and put my “sugar” on with hope. Soon my “castles” vanished one by one—for while waiting for my “sugar” to take effect I looked about for such species as were on the wing at dusk, and beyond three *Acidalia aversata* and one *Melanthia albicillata* I saw nothing. Turning to my “sugar” I found four much-worn *Leucania turca*, and my friend on his found one *Xylophasia polyodon*. On other nights our results were practically nil, for, except two or three *Mania maura*, nothing arrived. However, we solaced ourselves with the hope that the day-flyers would make up for our disappointment; and as the sun shone brightly on our first morning we started for the *Meliloti* ground, and all I can say is that no *Zygæna meliloti* came home on my setting-boards. One or two *Argynnis adippe* sported over the ferns; and upon our arrival at Wood Fidley, well known as one of the most productive grounds, we began to realize that something was seriously wrong. Here we searched the beech-trees for *Cleora glabraria* without result, and coming upon a warm corner we found a bramble-bush smothered with bloom and studded with four worn *Limenitis sibylla* and three *Argynnis paphia*. A single *Boarmia roboraria* rewarded me for my searching, which, being in good condition, was almost the only insect of value which I obtained during ten days’ work. This, bad as it was, was my best day’s collecting, for I did not see either *Triphæna fimbria*, *T. subsequa*, *Nola strigula*, *Acidalia straminata*, *A. inornata*, *Catocala promissa*, *C. sponsa*, *Apatura iris*, *Lithosia quadra*, and the many other species so certain in good seasons. We turned to beating with a like result, for beyond one *Notodonta chaonia*, which fell to my friend’s tray, and one half-fed *L. quadra* to mine,—no larvæ, except a few *Eupithecia pulchellata* from the foxgloves,—no others were seen. When I enumerate such other things as I have taken, and those mostly in the smallest numbers, viz., *Thecla quercus* (one),

Lycæna ægon (plentiful, but worn), *B. repandata* (three), *Geometra papilionaria* (two), *Phorodesma bajularia* (one), *Melanippe unangulata* (few), *A. imitaria* (few), *Eubolia mensuraria* (few), it will be seen that species are so scarce where they should be plentiful, that I trust some of our more experienced entomologists will give their opinions upon it. — H. JOBSON, JUN.; 3, Clarendon Road, Walthamstow, July 24, 1883.

NOTES ON THE SEASON. — I should like to record that up to the present I consider that the season, so far as Micro-Lepidoptera is concerned, has been a good one. I have been successful in taking *Coccyx pygmæana* and *Mixodia bouchardana* again this season, as well as many other rare Tortrices. Among the Tineæ I have bred a fine long series of *Psyche inconspicuellæ* and *Coleophora inflatella*, all from the county of Surrey. Among the Macro-Lepidoptera I have taken a great many of the larva of the red variety of *Taniocampa gracilis*, but I am sorry to say that about ninety per cent. are ichneumonised. In fact, parasites of Lepidoptera are very plentiful everywhere this year, both in and out of my breeding-cages. — CHARLES BODEN; 228, Bermondsey Street, S.E., July 17, 1883.

CAPTURES AT DOGWOOD FLOWERS.—The dogwood, or common cornel, is not included by either Green or Knaggs in their lists of plants whose flowers are attractive to moths. Possibly, therefore, it may be of interest to some readers of the 'Entomologist' to know that, on the evening of June 29th, my brother and I found moths swarming to the blossoms on Wimbledon Common. So plentiful were they that we remained at one shrub the whole time, and caught as fast as we could bottle. The atmospherical conditions were very favourable: a heavy thunderstorm passed over London an hour or two later. The following species were captured:—*Iodis lactearia*, *Cabera exanthemaria*, *Larentia pectinaria*, *Leucania impura*, *Axylia putris*, *Apamea unanimis*, *Miana strigilis* (black var.), *Miana arcuosa*, *Agrotis exclamationis*, *A. corticea*, *Noctua augur*, *N. festiva*, and *Hadena genistæ*. — F. J. BUCKELL; 316, Upper Street, Islington, N., July 11, 1883.

VANESSA CARDUI IN KENT.—My friend Mr. Biggs, who has been staying at Ramsgate during the past three weeks, observed this species in great abundance during the whole period. One was seen seven miles out at sea.—T. EEDLE; 40, Goldsmith Row, Hackney Road, London, E.

RETARDED EMERGENCE OF SPHINX LIGUSTRI. — In September, 1881, a gentleman brought me a specimen of the larva of *Sphinx ligustri* to name for him, which I did, instructing him as to its management, being nearly full-fed. It appears that he put it into his glass fern-case, and in a few days lost sight of it, forgetting I had told him it would bury itself in the ground to pupate. No further notice was taken until about the beginning of April this year (1883), when a fine imago appeared in his glass fern-case without any visible opening or means of access. This so excited his surprise that he brought me the insect alive in a tumbler, when I solved his riddle for him. Of course there is nothing extraordinary in this, except the circumstance that here was a pupa kept indoors in a temperature frequently far above the average, yet emergence was delayed or retarded nine months beyond the normal time, as it ought to have emerged in due course in June, 1882. This seems difficult to reconcile with forcing emergence by the natural or artificial application of increased temperature. I have often bred *S. ligustri*, sometimes in large numbers; but I have never before known any specimen of this species go beyond the normal time.—W. M'RAE; 3, Bedford Place, Bournemouth, July 16, 1883.

SPHINX PINASTRI.—I have done but little in Entomology for the past two years, but I had the good fortune to capture another *Sphinx pinastri* last year, within a few yards of the spot where I took the other which was recorded in the 'Entomologist' (Entom. xiv. 211), and am still on the look out for more, as I find I took one on July 22nd, 1881, and one July 23rd, 1882.—F. W. AGER; Borough Asylum, Ipswich, July 16, 1883.

DEILEPHILA LIVORNICA IN ESSEX. —Mr. E. Bond, of 12 Queen's Square, Upton Park, E., brought to me for inspection this week a fine recent specimen of *Deilephila livornica*, which he had the good fortune to find at rest on a door-post of a shop in Upton Park, on the 11th inst.—JOHN T. CARRINGTON; Royal Aquarium, Westminster, July 14, 1883.

VARIETY OF HEPIALUS LUPULINUS.—The white varieties of this swift are common enough on the old Guildford race-course, wherever there is any flowering grass, the first week in June. I have been endeavouring to catch one quite white, but have not hitherto succeeded. The soil is of course chalk. I hope

eventually to have some duplicates for brother entomologists.—
A. H. SWINTON; Binfield House, Guildford.

HEPIALUS VELLEDA IN SOMERSET.—As the authorities, such as Newman, Stainton, &c., give *Hepialus velleda* as almost exclusively a northern insect, it may interest your readers to know that I captured two specimens, and saw others, on the top of the Quantock Hills, on the evening of June 30th.—(Rev.) J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton.

HERMAPHRODITE ODONESTIS POTATORIA.—I have just had emerged from pupa a very curious specimen of *Odonestis potatoria*. The right antennæ is that of the male, whilst every other portion of the insect is exactly the same as the ordinary female. I do not know whether this is of common occurrence in this species, but have asked several gentlemen who have bred numbers of *O. potatoria*, and they have never noticed this curiosity.—W. T. WRIGHT; 40, Long Hedge Lane, Nottingham, July 4, 1883.

VARIETY OF EUBOLIA PALUMBARIA; EUTHEMONIA RUSSULA, EPIONE VESPERTARIA, AND SATYRUS HYPERANTHUS.—I took a beautiful variety of *Eubolia palumbaria* on Strensall Common, near York, on July 14th. It is a perfect specimen, and almost uniformly sooty black. The rust-coloured lines, which in the ordinary type are so much darker than the ground colour, are paler in the variety. On the same ground I took *Euthemonia russula* in good condition; and on the adjoining ground, at Sandburn, I netted a nice series of *Epione vespertaria*, which was getting over. With it the ringless form of *Satyrus hyperanthus* also occurred.—G. T. PORRITT; Huddersfield, July 19, 1883.

PROLONGED EXISTENCE OF ICHNEUMON IN PUPA. — I have this season another rather interesting case, about which possibly Mr. Bridgman, our excellent hymenopterist, may have something to say in the future. In 1880 I collected several dozen of the pupa of *Gortyna flavago* from the pith of young shoots of elder-bushes. Most of them duly emerged the following spring, but some few stood over until the spring of 1882. In April this year I wanted the use of the breeding-cage containing these empty pupa-cases, and commenced clearing it out, when I observed that one pupa presented a rather peculiar appearance. I broke off about three

of the anal segments of the pupa-case, when I found it contained a living larva. I transferred it to a glass-top box and observed it from time to time, and saw that life was continued and development going on, the colour gradually changing from opal-white to a jet-black. Although the anal segment protruded beyond the upper part of the pupa-case at first, they contracted until they were ultimately concealed or entirely withdrawn within the upper portion of the case, an occasional wriggle being the only indication of life. At last one morning an extra contortion or wriggle brought it entirely clear of the case, and there lay a partially-developed Ichneumon, quite alive, but rather inert; the dorsal area black, but the lateral and ventral areas straw-colour; the wings pale and semi-transparent; the legs all formed, but the creature seemed too weak to make any use of them. It lay as if dying, but in reality development was still going on, as was indicated by the gradually darkening colour of the sides and abdomen, until the parasite became conscious of its power to move its legs and wings, when I sent it to Mr. Bridgman in a lively condition. Here, then, is a case of an Ichneumon, like many of our Lepidoptera, continuing in the pupa state two years beyond what we suppose to be the normal time. Mr. Bridgman mentions that the parasites infesting *Zygæna filipendulæ* are known to have a similar prolonged existence in the pupa state. — W. M'RAE; 3, Bedford Place, Bournemouth, July 16, 1883.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—The ordinary meeting of this Society was held on Thursday, July 5th, 1883, at 94 New Kent Road, the President, Mr. J. R. Wellman, in the chair. Some very interesting specimens were exhibited, amongst which may be mentioned, *Prosopis dilatata*, *P. brevicornis*, *Heriodes campanularium*, and *Stelis phaeoptera*, all being taken on the platform at Box Hill Station by Mr. Billups, who also took *Pompilus spissus* in Headley Lane. Amongst recent exhibits have been a species of *Apanteles*, bred from a larva of *Boarmia repandata*. The whole brood emerged from the cocoon in the space of about half an hour, with one exception, which, although alive, and with its head outside the cocoon, was held a prisoner, and by this means perished. The total number of perfect insects produced was forty-two, the whole being female, with one exception. The second excursion of the season was held at Box

Hill, on Saturday, June 30th, where many good captures were made.—W. H. MILES, Hon. Sec.

ERRATUM.—Entom., No. 242, p. 160, line 5 from foot, for *Heliothis* read *Lomaspilis*.

REVIEW.

Insects Injurious to Fruits. By WILLIAM SAUNDERS, F.R.S.C., &c. Philadelphia: J. B. Lippincott & Co. London: 16, Southampton Street, Strand. 1883.

THIS handsome volume will doubtless be welcomed by the many practical men in a country in which economic Entomology is of so great importance. Its 436 demy 8vo pages treat of 266 insects injurious to nineteen fruit trees; and these are fully considered in their practical application, no part of the work being taken up with superfluous scientific descriptions or details; the 440 mostly excellent woodcuts with which the volume is illustrated being relied upon to aid the reader in his identification of any given pest.

The author's intentions are clearly stated in his preface as follows:—"Injurious insects are so universally distributed that there is no part of our continent where fruit-culture can be profitably carried on without some effort being made to subdue them. Among the insect-hosts we have friends as well as foes, and it is to the friendly species that nature has assigned the task of keeping in subjection those which are destructive; these, in many instances, do their work most thoroughly, devouring in some cases the eggs, in others the bodies, of their victims. It is not uncommon to find the antipathy to insects carried so far that a war of extermination is waged on all, and thus many of man's most efficient allies are consigned to destruction. . . . It has been the aim of the author of this work to bring together all the important facts relating to insects known to be injurious to fruits in all parts of Canada and the United States, to add to the information thus obtained the knowledge he has acquired of the habits and life-history of many of our insect-pests by an experience of over twenty years as a fruit-grower and a student of Entomology, and to present the results in as concise and plain

a manner as possible, avoiding all scientific phraseology except such as is necessary to accuracy."

In our opinion these good intentions have been faithfully carried out, and a valuable volume has been produced. The only faults we can find are the two which are general in similar works; firstly, that a great point is strained in including all the species treated of as injurious insects; and secondly, the remedies suggested for their destruction will often be found quite impracticable: these, of course, are more or less inherent, because from experience we all know that in certain seasons many species affecting certain trees can and do prove injurious, and the successful remedies against attack are in most cases yet to be learned. This will not be until the personality and nature of the insect-pest is thoroughly well known to the practical man, and the great aim of this and similar works should at present be to spread this much-needed information. It is also a great point to lead the practical man to distinguish between the gardener's friends and the gardener's foes: in no economic entomological work—except, perhaps, Curtis's admirable volume—has so much attention been paid to those great allies, the natural foes of the noxious species. The inclusion of many of the larger Rhopalocera, *Sphingidæ* and *Bombycidæ*, adds, perhaps, greatly to the entomological interest of the volume, but it is a great question whether they are not seriously out of place. Many bee-keepers will feel the consideration of *Apis mellifica* as an insect injurious to fruits to be a gross libel.

This volume well deserves attention in this country, as many of the species treated of are either indigenous and equally destructive here, or have close allies with similarly noxious habits. For instance, the American blight, or, as Saunders has it, the woolly louse of the apple (*Schizoneura lanigera*), treated of at pages 13 and 27; the codling moth (*Carpocapsa pomonella*), p. 127; the pear-tree slug (*Selandria cerasi*, Peck., recte *Eriocampa limacina*, Retz.), p. 150; the imported currant worm (*Nematus ventricosus*, Klug, recte *N. ribesii*, Scop.), p. 339; and others are concisely treated of in well-illustrated and reliable articles. One or two assertions appear doubtful; we should be inclined to be sceptical as to the normal double-broodedness of *C. pomonella*. *E. limacina* and *N. ribesii* are both spoken of as passing the winter in the pupa state; here we know they exist

as larvæ in their cocoons until quite late in the spring. The experienced Frederick Smith used to persist that no hymenopterous insect passed the winter as a pupa; this assertion, however, requires some slight modification. The American *Anthonomus* (*A. quadrigibbus*, Say) does not appear to be so destructive as our apple species, and the manner of oviposition appears to be quite different (see p. 134).

The numerous figures in this work will be tolerably familiar to the readers of the various State reports, of Packard's excellent 'Guide,' and of the 'Canadian Entomologist,' of which latter periodical the author is the editor. Their source, however, is very justly acknowledged in the preface, and they are mostly well worthy of the use to which they are put, the figures of *S. cerasi* and its ally, *S. vitis* (figs. 159 and 295), with one or two others, being the only exceptions.

In popular works popular names are more or less a matter of necessity, and in America the objection to their use is greatly minimised by the vulgar name being more often than not a literal translation of the scientific name. The term "locust" is repeatedly misapplied, and we are pleased to see the renowned *Caloptenus* referred to as "grasshopper or locust" (p. 157); the former correct name may thus make headway. But, on the other hand, it is a great pity to have *Cicada septendecim* again styled the "Seventeen-year Locust." The volume concludes with a short synonymic list referring to many of the species treated of, and with a good index.

To all entomologists this cheap and thoroughly well got-up volume can be strongly recommended; much will be found to instruct and interest, especially the curious forms of larvæ, e. g., *Empretia* (fig. 112), *Phobetrum* (fig. 111), *Nematocampa* (fig. 179), *Proceris americana* (fig. 275), which greatly reminds us of the larvæ of *Trichiocampus viminalis*, Fall., feeding on our own poplar-leaf, &c. To the gardeners and practical fruit-growers of this country much of the information will prove readily applicable and of generally good service until Miss Ormerod produces an enlargement of her 'Manual,' or, still better, a similar work on our British species.—E. A. F.

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[No. 244.]

OBSERVATIONS ON INSECT-LIFE IN 1883.

BY PETER INCHBALD, F.L.S.

I SHALL not confine my remarks to the plant-miners alone, as in previous years, but shall touch upon other representatives of insect-life that happen to have come under my notice during the current year. To ensure exactness as to time and date, I will tabulate my observations month by month. A calendar of this kind is more likely to attract the attention of collectors than one of a more diffuse and desultory character.

March 30th.—*Cecidomyia betulæ*, Winnertz, first appeared in the glass-topped box; and these little gall-gnats continued to come forth from the capsules of the birch catkins of the previous year during the month of April. Sometimes I had a score in my box at one time. Small as this Cecid is, it is not free from the attacks of a still smaller Chalcid. Franz Löw has admirably described the larval and pupal states of this tiny Cecid, and I had but to follow him in my researches.

April 12th.—The deflected rosettes of *Salix capræa* gave forth their tenants on this and following days. I am still doubtful about its reputed identity with *Cecidomyia rosaria*. The bosses are all deflected, a distinct loop serving so to curve the rosette that it is made to face the surface of the ground below.

April 16th.—*Nematus croceus* hatching abundantly from the pupæ of last May; I collected the larvæ from the edges of the leaves of *Salix capræa*. The cocoons are dull blackish brown, somewhat larger than those of the gooseberry sawfly. The imagines appeared each morning, quite to the close of the month of April. I reared nearly a score.

April 28th.—Picked up a larva of the glow-worm on the Ormes Head, Llandudno. It fed on the mucus and exuviae extruded by a snail (*Helix*), assuming pupahood at the close of May. The colours of the pupa-case showed more of rose on the under side, blended with the grey. It continued to emit light, which became intensified as it assumed the imago stage of existence on the 6th of June.

May 14th.—The first carrot-fly (*Psila rosæ*, Fabr.) emerged to-day from its pupa-case. It had remained in the soil, under a bell-glass, since August of the previous year. The pupa-case is pale brown, small and shining, obliquely truncated at one end. Dr. Meade tells me that "the carrot-fly was named *Musca rosæ* by Fabricius, who seems to have known nothing of its early history." Meigen says the *Psilæ* are found on bushes in hedges, but that nothing is known of their life-history. Dr. Meade observes further that probably Fabricius may have captured the fly on a rose, and therefore he named it after that flower. Curtis, I believe, is the first to mention that *Psila rosæ* feeds on the carrot in the larva state.

May 16th.—Vinegar-flies (*Drosophila fenestrarum*, Fallen) appeared in all their stages in a vinegar cask. All the *Drosophilæ*, not a numerous family, breed in sour vegetable matters. The most common (*Musca cellaris*, Linn.) is found in our beer cellars, and closely resembles *D. fenestralis*, but is larger; and has the "transverse veins of the wings further apart," writes Dr. Meade.

May 22nd.—Collected a handful of disembowelled humble bees under sycamore trees. The abdomen is nearly always more or less eaten away—probably by the common shrew? I am told that Darwin mentions the circumstance of our humble bees being decimated every year by mice. I never find the moss bee or the red-tailed bee so mutilated.

May 27th.—The *Cardamines*, both *C. pratensis* and *C. amara*, had their flower-buds strangely distorted by the little red larvæ of *Cecidomyia cardaminis*, Winnertz. In very swampy places, among *Sphagnum* moss, scarcely a plant escaped. I failed to rear the gnats in April from larvæ collected in May, 1882. Winnertz tells us that he bred this little *Cecid* after repeated failures. I trust to be successful another year.

June 25th.—Flights of glow-worms attracted to our lamps, as many as eighteen appearing at one window. Such flights look

almost like migration. They appeared as soon as it was dusk on various evenings, and continued to come for nearly an hour. The most remarkable circumstance was that I noticed no females on the green-sward of the terrace below to account for their appearance in such quantities.

July 7th.—The long straight mines of *Phytomyza plantaginis*, Goureau, running parallel to the mid-vein of the leaf of the ribwort plantain (*Plantago lanceolata*). Robineau Desvoidy says, "it hollows out a very narrow gallery, at the end of which it changes into a yellowish pupa."

July 8th.—Reared *Phytomyza affinis*, Macquart, from leaves of the knapweed (*Centaurea nigra*). In a letter, dated August 4th, Dr. Meade observes:—"I think that *P. affinis* and *P. albiceps* are probably only varieties of each other, the chief point of distinction being that in the former there is a narrow pale line in *all* the abdominal segments, while in *P. albiceps* there is only *one* (wider) on the penultimate segment."

July 25th.—In May or June of this year a friend, residing at Driffild, in the East Riding of Yorkshire, reared from a larva of the garden tiger, *Chelonia caja*, examples of *Exorista chelonix*, Rondani, which he put into my hands. I sent them at once to Dr. Meade, and I learn that Rondani bred this fly, one of the *Tachinidæ*, from a similar pupa. Dr. Meade says, "I have not seen an English specimen of this fly before, though I have two German ones."

Fulwith Grange, near Harrogate, August, 1883.

GRAPHOLITHA CÆCANA, Schläger. (CÆCANA, H.-S.):

A TORTRIX NEW TO BRITAIN.

BY GEO. COVERDALE.

HEAD pale brownish gray; eyes black; face and palpi pale ochreous gray; apical joint of palpi slender, nearly as long as the basal, which is stout and curved upwards; middle joint ascending, curved, more than twice as long as the apical, and as stout as the basal, being slightly thickened beyond the middle, and clothed with rough projecting scales; antennæ brownish grey; thorax rather slender, ovate, brownish grey. Anterior wings

nearly three times as long as broad. Costa slightly but regularly arcuated, apex rather produced, anal angle rounded. Colour shining brownish grey, dusted with ochreous, particularly towards the hind margin. The costa, which is very pale grey from near the base, has about seven black geminations, the first four or five being very obliquely placed. The first streak of the third gemination is much produced, and may generally be traced as a curved line across the wing to the anal angle; the second streak of this gemination also runs with the first to the anal angle, but almost from the costa it changes to a lustrous leaden blue. The fifth gemination is much produced towards the hind margin, its second streak being lustrous leaden blue, and joining another blue streak, which comes from the costa nearly parallel with the hind margin. On the disk are two or three parallel longitudinal black lines, and another along the fold to the anal angle. Towards the hind margin are a few short, transverse, irregular, black streaks. Cilia smoky grey. Posterior wing—apex obtuse, slightly produced; anal angle rounded. Colour pale grey, with long, slightly paler cilia. Abdomen long and slender, grey. In the female the posterior wings are dark brownish grey, with paler cilia. Expands 6 lines.

The insect may be distinguished at a glance by the elongate anterior wings, pale costa, and longitudinal streaks, from any other British Tortrix. It occurred locally, near Deal, in the early part of July, amongst *Ononis spinosa* and *Onobrychis sativa*, and I thought at once it was something new. After exhausting all our works on the subject, I showed them to Mr. H. T. Stainton, with whose kind assistance it proved to be the above species. It is described and figured by Herrich-Schäffer in his 'Systematische Bearbeitung der Schmetterlinge von Europa' (iv., p. 253), 257. He places it in his Subgenus xxix., *Grapholitha*, Tr., Dup., which includes such insects as *Stigmonota leplastriana*, *Catoptria microgrammana*, *C. albersana*, *Semasia wæberana*, *Opadia funebrana*, &c. By Heinemann it is mentioned, 'Die Schmetterlinge Deutschlands, &c.', ii., 180, as occurring about *Ononis spinosa*. In Staudinger's 'Catalog der Lepidopteren, &c.', it stands under the genus *Grapholitha*, Tr., section D, *Semasia*, H.-S., in company with *Catoptria citrana*, *C. wimmerana*, *C. hypericana*, *Stigmonota coniferana*, *Coccyx strobilana*, &c. The *Grapholitha* of these

continental authors seems to include a miscellaneous selection from *Coccyx*, Tr., *Stigmonota*, Gn., *Catoptria*, Gn., *Endopisa*, Gn., and *Carpocapsa*, Tr. From *Grapholitha*, Stephens, it is excluded by the structure of the palpi and the venation of the wings. Its most natural position seems to be between *Endopisa*, Gn., and *Stigmonota*, Gn., resembling the latter genus closely in the structure of the palpi. This, however, is but a crude opinion, and I should be glad to hear some of our older hands on the subject. Nothing certain appears to be known about the larva, *Ononis spinosa* and *Onobrychis sativa* being mentioned as probable food-plants. On the Continent it occurs in May and June, near Jena, Vienna and Wiesbaden, and in Hungary, Andalusia, and Southern Russia.

24, Fleming Road, Lorrimore Square, August 6, 1883.

NOTES ON THE SEASON.

BY EDWARD A. ATMORE.

DURING last year, and the commencement of the present, entomologists residing in various parts of the United Kingdom were nearly unanimous in stating the season of 1882 to be a bad one for Lepidoptera; Macro-lepidoptera especially were represented as scarce, and in this I concurred. I also observe, from notes which have recently appeared in the 'Entomologist,' that some of your correspondents speak of the present season as being an unsatisfactory one; but so far I cannot complain of the paucity of Lepidoptera in West Norfolk; indeed, to say the least, imagines were plentiful up to the 10th of July, when a course of wet weather set in, which, much to my regret, still continues. Micro-lepidoptera have been especially numerous, several species of Tortricidæ being commoner than I have ever before observed them. Among the Macros the Noctuæ have been more abundant than usually is the case. Some exceptions to this of course there have been, and always will be; but there has been one great drawback to collecting, viz., the unusual plenty, and I might say unusual activity, of those little pests commonly known as "midges" (our country-folk are pleased to call them "midgeons"). These insidious atoms on some evenings almost compel one—if "the weed" is at all indulged in—to keep up a

"perpetual smoke," or give up the pursuit. However, I will not dilate further on this, but proceed to enumerate some of the species of Lepidoptera met with here.

The sallows, as I have before observed, are not remarkable for attracting rarities, but out of the commoner herd of *Tæniocampæ* and hibernated species might be boxed as usual a few *Xylocampa lithoriza*, *Trachea piniperda*, *Anticlea badiata*, *Larentia multistri-garia*, *Tæniocampa gracilis*, *T. rubricosa*, and an odd *T. munda*. A single *Cymatophora flavicornis* was also met with on a birch tree, apparently drying its wings. *Brephos parthenias* could be seen in numbers at the beginning of April flying leisurely about the tops of birch trees, now and then one descending within reach of the net. *Tortricodes hyemana*, if desired, could be taken in plenty by beating oak trees in and around woods.

After the sallows had done blooming came a lull in collecting; but during April a few *Heusimene fimbriana* were captured in the bright sunshine flying around oaks, and the birch trees yielded a nice series each of *Micropteryx sparmanella*, *M. unimaculella*, and *M. semipurpurella*, whilst *M. purpurella* was plentiful, and of course *M. subpurpurella*—often mistaken for something better—was ubiquitous among oaks, from which trees an occasional *Eupithecia abbreviata* was disturbed. Upon the arrival of May—a month always welcomed by entomologists because of the many species then emerging from pupæ—our district became enlivened with insects. Among the Macros taken this month were *Lycæna agestis*, *Cidaria suffumata*, *C. corylata*, *C. silaceata*, *Platypteryx hamula*, *P. falcula*, *Tephrosia punctulata*, *Ypsipetes impluviata*, *Phytometra ænea*, *Emmelesia albulata*, *Eupithecia indigata* (fine and plentiful), *E. castigata*, *E. nanata*, and a single worn *E. dodoneata* on railings. The Tortrices which have been fairly common are *Phlæodes tetraquetra*, *Clepsis rusticana* among *Myrica gale* (bog myrtle), *Phoxopteryx siculana*, *P. biarcuana*, *P. uncana*, *Coccyx splendidulana*, *C. argyrana*; and at the end of the month, flying in the bright sunshine among *Ulex europæus* (furze), *Stigmonota internana*, looking much whiter on the wing than its commoner companion, *Catoptria ulicetana*. The following are some of the Tineæ met with:—*Coleophora albicostella* and *C. murinipennella* among furze and *Luzula* respectively. Of the *Lithocolletidæ* I noted *Lithocolletis tristrigella*, *L. schreberella*, *L. stettinella*, *L. hortella*, *L. trifasciella*,

L. corylifoliella, and *L. salicicolella*. Other Micros captured were *Eupœcilia nana*, *Phlæodes immundana* (a very uncertain species, and not so common this year), *Phoxopteryx mitterbacheriana*, *Swammerdamia griseocapitella*, *Tinea bistrigella*, *Perittia obscuripunctella*, and *Gracilaria tringipennella* (readily obtained by sweeping meadows where *Plantago lanceolata* thrives). Pupæ collected from the central shoots of *Pinus sylvestris* (Scotch fir) in the earlier part of the month yielded some fine specimens of *Retinia turionana*.

In June a visit to fields, hitherto unworked, rewarded me with a long series of *Procris statices*: a hundred could easily be taken in a very short space of time by sweeping, or searching flowers of *Scabiosa succisa* (devil's-bit scabious) and *Trifolium pratense*. This has been the first season I have made acquaintance with this species, and one cannot help being struck with Mr. Stainton's remark in the 'Manual' on the species in question. In the same meadows *Emmelesia albulata* would start up every few yards from among its food-plant, viz., *Rhinanthus crista-galli*.

A day's collecting on the 13th of June in a fenny district and adjoining country, near this town, proved well worthy of further attention. Many marsh or fen plants flourished there, such as *Comarum palustre*, *Menyanthes trifoliata*, *Valeriana dioica* and *V. officinalis*, *Thalictrum flavum*, *Iris pseudacorus*, &c.; and *Peucedanum palustre* grew in such abundance that one might almost wonder at the absence of *Papilio machaon*. Larvæ of *Tæniocampa gracilis* were common in screwed-up leaves and tops of *Spiræa ulmaria* (meadow-sweet), as also were larvæ of a Tortrix, which would no doubt be those of *Peronea aspersana*. Puckered leaves of *Angelica sylvestris*, tenanted by larvæ, are now producing some *Depressaria angelicella*. On this day, amongst others, the following Macros were taken:—*Argynnis selene*, which by the way I was pleased to see, for Fritillaries are of rare occurrence in this neighbourhood; a fine series of *Hydrelia unca*; *Halias clorana*, *Collix sparsata*, *Phibalapteryx lignata*, *Eupisteria heparata*, *Ypsipetes impluviata*, and ten specimens of *Eupithecia pygmæata*, mostly in fine condition. In the woods adjoining the fen were *Lithosia rubricollis*, *Macaria liturata*, *Eupithecia indigata*, *E. exigua*, *E. castigata*, *Asthena luteata*, and *Euclidia mi* (in open grassy places). Of Micros on this occasion I noted *Orthotænia antiquana*, *Coccyx*

nanana, *Eupæcilia nana*, *Choreutes scintilulana* (among *Scutellaria galericulata*); *Phlæodes immundana* (getting worn), *Nemophora metaxella*, and *Bucculatrix cidariella* (among alders); *Elachista cerussella*, *Gelechia rufescentella*, *Swammerdamia cæsiella*, *Scardia arcella*, and *Bucculatrix cratægifoliella*. In all, 130 species observed.

Early in June *Bombyx rubi* was out in numbers on our heaths, its wild flight and size making it a very conspicuous object. In similar places *Heliodes arbuti*, *Heliothis dipsacea* (one specimen only), *Agrotis porphyrea*, *Pempelia palumbella*, *Phycis carbonariella*, and *Platytes cerussellus* were taken; the latter, although local, has absolutely appeared in hundreds in some grassy spots on the heaths. Also during the month, *Acidalia subsericeata*, *Emmelesia decolorata*, *E. alchemillata*, *Melanippe unangulata*, and *Ephyra pendularia* were to be found at dusk; whilst out of the host of commoner Noctuæ attracted by sugar might be boxed a few *Dipterygia pinastri*, *Hadena suasa*, *Leucania pudorina*, *L. comma*, *Erastria fuscula*, *Acronycta leporina*, *A. aceris*, *Axylia putris*, *Aplecta advena*, *Caradrina morpheus*, *C. alsines*, *Agrotis corticea*, and *A. porphyrea*. The commonest insect at sugar during June was undoubtedly *Agrotis exclamationis*; but *Rusina tenebrosa* and *Miana fasciuncula* were nearly as plentiful. In and about the warehouses of the King's Lynn Dock Company, *Plodia interpunctella* was more abundant than I have ever before known it. Of the Micros not yet enumerated I note *Retinia pinivorana*, *Gelechia dodecella*, and *Cedestis farinatella*, among Scotch fir; *Orthotænia ericetana*, *Grapholita campopolitana*, and *Æcophora trisignella*; *Elachista subochreella* and *Tinagma resplendella* among alders; *Bucculatrix boyerella* among elm; *Pædisca bilunana*, *Penthina picana*, and a single specimen of *Phlæodes demarniana*, among birch trees; *Opostega saliciella*, *G. ligulella*, *G. tenebrella*, *C. affinis*, *C. diffinis*, *Coleophora fabriciella*, *Micropteryx seppella*, and *Adela fibulella*, were obtained by sweeping mixed herbage of meadows and corners of heaths.

Early in July I note as follows:—*Lycæna ægon*, just coming out; *Ebulea verbascalis* and a nice series of *Oxyptilus teucii* among *Teucrium scorodonia*. Although this (the food-plant) grows nearly everywhere in patches on our heaths, this plume would appear to be excessively local, being confined to a few yards. *Crambus uliginosellus* *C. inquinatellus*, *Schrankia turfo-*

salis (common), and *Hyphenodes costæstrigalis* (less frequent), on heaths; and *Macroglossa stellatarum* of constant occurrence in the town; some fine specimens of *Tortrix sorbiana*, and a few fine specimens of *Stathmopoda pedella*, apparently just emerging.

If I mistake not, *Plusia gamma* will be a perfect pest shortly. I first observed this species about the middle of May, and since that time it has been steadily on the increase. The pale colouring of the early specimens was very apparent, and I therefore suspect they had migrated from the Continent. Numbers of *Cynthia cardui* have also been observed (of course in worn condition), so that the insect will probably be commoner this autumn than it has been since 1879.

From the above remarks I think it will be seen that Lepidoptera have been far from scarce in this district; and, should the present wet and uncertain weather clear up shortly, I have reason to anticipate that my captures for 1883 will bear comparison with those of previous years.

8, Union Street, King's Lynn, Norfolk, July 18, 1883.

NOTES FROM BOURNEMOUTH; AND REMARKS ON THE SCARCITY OF LEPIDOPTERA.

BY W. McRAE.

THE yearly increasing scarcity of Lepidoptera during the last few seasons has aroused a spirit of enquiry among naturalists as to the causes, or combination of causes, which have produced this result. Mr. F. De V. Kane, in his interesting remarks in the 'Entomologist' (Entom. xvi. 52), suggests three probable causes, *viz.*, mild open winters, high winds and storms in spring, and unusual atmospheric conditions at the usual time of collecting. All these have, doubtless, as he has shown by careful investigation, and comparison of reports from various parts of the country, here as well as in Ireland, proved disastrous to lepidopterous insects. Whether they are of a sufficiently exceptional character to account for the extraordinary dearth of insects which prevails this season all over the country and in all situations, I would not pretend to say. I have no hesitation, however, in affirming that whether we attribute the scarcity to the

causes enumerated by Mr. F. De V. Kane, or suspect the existence of some latent but far more fatal agent, the fact remains patent, and indisputable, that many insects are now reduced in numbers, individually and specifically, to a point verging perilously on extermination; and I think it highly probable that many years must elapse before some species can again multiply and increase to their former normal numbers. This is a rather discouraging view to take, but when we find all the recognised methods of collecting fail we are driven to the unwelcome conclusion that large numbers are now non-existent, and therefore cannot obviously be lured by sugar, attracted by light, swept into the net, or in the larva stage shaken from their food-plant into the beating-tray.

Having heard of the complete failure of our forest species to put in an appearance, I determined to pay a visit to the New Forest, and test the accuracy of the reports for myself. Accordingly, on the 10th of July, I started for Brockenhurst, and having met my friend Mr. P. Bright, who had preceded me thence by a few days, we proceeded to our hunting-ground. He told me that, although he had been working diligently all day since his arrival, he had scarcely seen or taken anything; and that, with the exception of what I might fitly designate as some heroic collecting the previous evening in quest of *Acidalia emutaria* in the Hinchelsea Bog,—which involved the necessity of wading knee-deep in the mire, with the possibility of sinking at any step up to the middle,—he had scarcely secured anything worth the trouble of setting. Considering the risk and discomforts attending the “bog” work, followed by the inevitable walk of four miles home in the dark, I think thirteen specimens of *A. emutaria*, as the result of the united efforts of Mr. Bright and his coadjutor Mr. Gulliver, by no means an extravagant reward.

We scoured, on the day of my arrival, seven or eight miles of the best localities in the Forest, with the net result of two *Limenitis sibylla*, three *Argynnis paphia*, one *Macaria liturata*, one *Eubolia mensuraria*, one *Zygæna filipendulæ*, the latter the only representative of that genus we saw on the “*Meliloti* ground;” and, for want of better game, I filled some of my boxes with spiders and dragonflies. Gentlemen accustomed to collecting in the New Forest in the middle of July, on a very fine day, will understand the significance of some eight miles (including

New Copse, Stubby, and Ramnor) being traversed by two fairly experienced and active collectors during some eight or nine hours with only the above meagre result. Of such insects as *Liparis monacha*, *Eurymene dolabraria*, *Phorodesma bajularia*, *Cleora glabraria*, *Lithosia quadra*, *Z. meliloti*, not a single specimen was seen.

In Bournemouth and neighbourhood a few species—such as *Pachynemias hippocastanaria* and *Euthemonia russula*, *Nemoria viridata*, *Acidalia subsericeata* and *Plusia gamma*—have appeared in fair numbers; but the great bulk of common species, and such as are usually taken at sugar, are quite as scarce here as elsewhere. On the evening of June 29th I had the good fortune to take, on our heath, a specimen of *Heliothis peltigera*; and Mr. Bright took another specimen, near the same place, two evenings later.

A few years ago, having succeeded in establishing a colony of *Psyche villosella* in a quiet unfrequented corner of our heath, from which I bred several dozen males last season, I was in hopes of breeding a still larger number this; but a careful examination on several visits has disappointed my cherished expectations, and convinced me that the same causes that have proved so fatal to other Lepidoptera have been equally disastrous to my colony.

A friend suggested, the other day, that the large increase of collectors during the last few years may account for the abnormal reduction in Lepidoptera. Local species confined to a limited area might be, and as we know have been, partially or temporarily exterminated, but the range of most species is so extended as to render it next to impossible for any number of collectors to effect any sensible diminution. A slight increase in the number of birds that prey upon insects would be infinitely more destructive, and I am told that birds were never known to be so numerous as they are now in the New Forest. I have never seen the trees, especially deciduous trees, so rich in foliage, nor vegetation so luxuriant, as at present; and here I think there is a ray of hope for the entomologist, for not only will the wealth of foliage and herbage afford abundant sustenance, but, what is equally important, afford a protection to larvæ, that have, for the last two seasons, been exposed to countless enemies on leafless trees and bare stunted herbage.

NOTES ON THE EARLY PART OF SEASON, 1883.

BY H. T. DOBSON, JUN.

THE expression of opinion amongst Macro-lepidopterists seems to be general,—that although last year the great majority of insects were exceedingly scarce, yet the first six months of 1883 must rank as a greater failure. Now, with one or two exceptions, I can fully endorse this.

Having worked almost daily in New Malden, and its neighbouring localities, I find that the result of my captures to the middle of June (not counting the Micro-lepidoptera) is not equal to two good days' work. However, as July drew near matters considerably improved: "sugar" yielded profusely, and we found plenty of occupation with the net at twilight, most of the things we usually take being well represented. Amongst the number *Phorodesma bajularia* was unusually common; and some insects, such as *Melanthia albicillata* and *Pericallia syringaria*, both of which species I failed to see last summer, have turned up in their usual numbers. I also noticed that flowers were very attractive; one bed of lilies, which I worked for a few nights, was swarming with about a dozen species, such as *Plusia gamma*, *P. chrysitis*, and *Cucullia umbratica*. July arrived, and my setting-boards were as full as could be expected, even for this busy month.

With every appearance of a continuance of success, I determined to try the New Forest; so in company with Mr. A. Mitchell we arrived at Brockenhurst on July 20th, but before we reached the Forest we had ample proof that "bad news travels quickly," for we were speedily informed of the unfortunate experiences of collectors already there. Nevertheless we were not discouraged, but worked on with energy and patience, both of which we found very essential qualities in order to make a solitary capture. We sugared many trees for four nights in different parts of the Forest, but failed to attract a single moth. In the daytime we were out during the best hours of sunshine, and went through some of the most favourable rides, where, at the same time last summer, we took or counted twenty-one species of Diurni, but upon this occasion we could only find thirteen, few of which were deemed worthy of a place in our collecting-boxes. We tried

beating for larvæ, which proved no more interesting and profitable than "sugaring" and general night-work. The only Geometræ that we met with in the daytime were *Acidalia immutata* and *Minoa euphorbiata*, which, with a few Pyralides and Tortrices, were all we could show for four days' collecting. Under these circumstances we thought it well to turn our attention to the heaths and bogs; so starting early in the evening, with one of the latter in view, we strolled across the heath, and in doing so we found that it produced a short series each of *Selidosema plumaria* and *Acidalia straminata*; also a few *Eupithecia nanata*, *Lithosia mesomella*, and one *Gnophos obscurata*. Upon reaching the bog we waited for sunset, when we were fully employed in taking a number of *Acidalia emutaria*, an insect very easy to secure if it were not for the fact that one had to wade through a foot of mud and water to get at it. We also found *Hydrocampa nymphæalis* and *Schœnobius forficellus* flying in profusion, and a few *Nudaria senex* and *Schrankia turfosalis*, which, with some Tortrices and *Scopariæ*, kept us quite lively till darkness set in. We then lighted our lamps, but as they only proved the means of inducing some New Forest ponies to pay us a visit, we left the latter masters of the situation, and went home for once with all our boxes occupied.

After returning to New Malden I was much interested to ascertain if things were as common at "sugar" and on the wing as when I left. This I found to be the case, and may mention that among my first captures were *Apamea ophiogramma*, *Triphæna fimbria*, and a long series of *Cænobia rufa*; the last named I have not seen in this district before, although I have worked it for many years.

In concluding these notes I ought to mention that the horticulturist during the past spring has enjoyed quite an immunity from many insect pests, which in some measure compensates for the disappointment sustained by the entomologist in not being able to enrich the drawers of his cabinet.

New Malden, Surrey, August 10, 1883.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEPIDOPTERA IN THE NEW FOREST.—It is usually with hopeful anticipations that the lepidopterist packs up his apparatus and takes his ticket for that favourite collecting-ground, the New Forest; and it seldom falls to his lot to experience such a disappointment as has fallen to those who have resided there during the last month, *viz.* July. The hope of turning up something new, or at least of adding to his stock of rarities several interesting specimens, makes a trip to the above locality an event to be thought of for several months previously. If he has entertained any doubt with regard to the old proverb, that "The pleasures of anticipation are greater than those of realisation," he will still be in doubt, for his experience during his visit will assuredly not tend to dispel the idea, should he have formed such, that the realisation was half as pleasant as the anticipation. Upon his arrival, at the end of the second week in June, he would have soon observed that few species were on the wing, and even many of those which are usually plentiful everywhere were not to be seen. Such a paucity of species must have been very noticeable to a sojourner at the New Forest during this time, and cannot have failed to arouse his curiosity to know the meaning of what appears at first sight incomprehensible. Disappointment so often falls to the lot of the entomologist in this fickle climate of ours, that the more advanced among us begin to look upon it as the most likely thing to occur when an excursion, having for its object the acquisition of some required species, is planned. Of course he will set off his many pleasant surprises on the other side, and it is to these that the science of Entomology is much indebted for its fast-increasing votaries. Even this latter was not vouchsafed to those who followed their usually pleasant amusement in the locality named, and the apparition of a few *Satyrus hyperanthus*, *Lycæna ægon*, *Hesperia sylvanus*, *H. linea*, and *S. janira*, failed to cheer the eager entomologist in search of such interesting varieties of *Argynnis paphia* and *Limenitis sibylla*, as are so often exhibited by those who have visited the New Forest. To say that even the two last-named species were scarce would be but to give an accurate account, for during a stay of ten days hardly two dozen of either were observed, and that in places

where they are usually so plentiful that a few hours' sport is generally sufficient to satisfy the most ardent advocate of the exchange system. One's hopes naturally turn to the other "good things" found on the wing there at this season, but only to be again met with disappointment. Such species as one naturally expects to find—as *Selenia illustraria*, *Acidalia inornata*, *Hyria auroraria*, *Acosmetia caliginosa*, *Heliothis dipsacea*, *Lithosia mesomella*, *Liparis monacha*—were not on view; and a very small number of *Ypsipetes impluviata*, *Eubolia palumbaria*, *E. mensuraria*, *Hemithea thymiararia*, failed to make amends for *Boarmia roboraria*, *Euthemonia russula*, *Heliothis dipsacea*, and *Aspilates strigillaria*; nor did an occasional *Zygæna filipendulæ* tend to lighten the gloom in our minds caused by the absence of *Z. meliloti*. "Try the flowering ragwort, the waving grass-tops, the sweet-scented, ever tempting bloom of the bramble," wrote a kind entomologist to whom we had written; but his advice, although strictly followed, proved useless, except in one solitary case, when we found, on the undergrowth near an alder, a few *Geometra papilionaria*. An occasional *A. aversata*, *Melanthia albicillata*, *Pseudopterpna cytisaria*, *Phorodesma bajularia*, *B. repandata*, were seen, but few and far between; and but one or two of *Pericallia syringaria*, *Cleora lichenaria*, and *Selenia illunaria*, were secured. A visit to these parts without seeing a few *Leucania turca*, *L. quadra*, *Catocala promissa*, and even *C. sponsa*, on the sugared trees, is certainly worth recording, for every account of a visit at this season is almost sure to number them in its list. Such an account as that given above ought to be explained by those who profess to know all about the cause and effect of the abundance or scarcity of species; and although I refrain from venturing an opinion at present upon the reason of such abnormal scarcity, yet I shall be pleased to hear the opinion of those who are generally looked upon as being able to elucidate such questions; for the usual answer that "things are scarce" is hardly, to my mind, a satisfactory one.—W. H. WRIGHT; Secretary's Department, Inland Revenue, Somerset House, W.C.

NOTES FROM YORK.—Seeing that the reports from the South of England are very discouraging as to the scarcity of Lepidoptera for that part of the season already past, I have thought that a few notes from the North might be of some interest to entomologists, at the same time feeling sorry that the efforts

of our friends in the South have been crowned with such little success. It sometimes occurs to me that there is a great deal more collecting now than there was some years ago, and that the great number of captures made causes a paucity in the succeeding years; but when I look at such species as *Triphæna pronuba*, *Xylophasia polyodon*, and many others which we do not trouble to capture, and find them in decreased numbers, it seems to annihilate the idea. The early part of the season I cannot say was so profitable as the previous year, for although many common species appeared in their normal numbers, yet others were quite absent: for instance, last year where I took *Tephrosia punctulata* and *T. biundularia* in plenty, this year, after several searchings at different periods, I did not even find a solitary specimen. But as time passed along prospects began to appear a little brighter; and at the beginning of June we found, at Askham Bog, the pretty little Noctua, *Hydrelia unca*, fairly common, also *Phibalapteryx lignata*; we also took *Procris statices*; and by the middle of July insect-life seemed to be thoroughly on the move. As an example of our collecting here I have selected the night of the 24th of July as a fair representative out of several evenings upon which we worked during that month. Along with Mr. S. Walker, we arrived at our collecting-ground, viz., Sandburn, about 8.30 p.m.; and our departure took place about 12.30 a.m. During that time we captured and observed over sixty different species of our Macro-Lepidoptera. To enumerate them all would, I am afraid, occupy too much space; and I will therefore select a portion which will, I trust, convey a fair idea of what we, in our estimation, considered a tolerably good evening's work. *Lithosia mesomella* we found sitting calmly on the stems of grasses, and therefore a very easy capture. This insect was more common in the earlier part of the month, it being a matter of no difficulty to obtain two or three dozen in one night. Among my captures was a variety of this species; instead of the fore wings being dingy white they were of an orange tint, somewhat resembling the colour of *Lithosia quadra*. *Euthemonia russula* were fairly common. *Epione vespertaria* was not so plentiful as in previous years; the usual time for the flight of the males is in the early morning, from 6 to 9 o'clock, the female being very rarely taken on the wing, but is occasionally found at rest. We also took *E. apiciaria*, *Hepialus hectus*, *Metrocampa margaritata* (common),

and *Geometra papilionaria*. This latter is a glorious insect, and to see it on the wing seems to elevate one to the highest pitch of enthusiasm. We had also *Ellopiæ fasciaria* and *Phorodesma bacularia*; this latter insect, on the 10th of the month, being common for the brief space of fifteen minutes. Also *Acidalia bisetata*, *A. inornata*, *Eupithecia nanata*, *E. minutata*, *Melanthia rubiginata*, *M. ocellata*, *Scotosia undulata*, *Cidaria pyraliata*, and many others. At sugar we found no great profusion of insects, but a fair number of species: for instance, *Thyatira derasa*, *Acronycta leporina*, *Miana strigilis*, *Agrotis velligera* (fairly common), *Leucania pallens*, *L. comma*, *Triphæna fimbria*, *Noctua plecta*, *N. c-nigrum*, *Euplexia lucipara*, *Aplecta herbida*, *Plusia chrysitis*, &c. Since that date we have been adding others to our list, including *Epunda viminalis*, *Orthosia suspecta*, *Notodonta dictæoides*, *Acidalia scutulata*, *Crocallis elinguaris*, &c. — R. DUTTON; 13, St. Saviourgate, York, August 14, 1883.

CAPTURES OF LEPIDOPTERA.—Our best captures here this year as yet are:—*Tæniocampa leucographa*, caught at sallow in April; *Notodonta trepida*, bred in May from pupæ dug last autumn; *Macroglossa bombylifformis*, about twelve, caught in May at flowers of *Pedicularis sylvatica* (lousewort); *Acronycta alni*, at sugar in June; *Tethea retusa*, bred in July from larvæ found in the spring.—(Rev.) C. A. SLADEN, Burghclere, Newbury, August 1, 1883.

VISITORS TO HONEYSUCKLE.—The number of species which visit this plant does not appear to be very large, yet a few good kinds may generally be obtained, the three following species, characteristic of this flower, being always present in greater or lesser numbers during the season:—*Chærocampa porcellus*, *Cucullia umbratica*, and *Plusia iota*. This year I have taken several specimens of *C. porcellus*, thirteen *Cucullia umbratica*, and sixteen *P. iota*. These species were all caught during three evenings at about half-past 9 p.m. The *C. porcellus* I have never found later than 8 o'clock. The best time is half an hour earlier. Last month (June) it was somewhat less numerous than usual, while *P. iota* was very abundant. In 1879 I was very successful at honeysuckle, capturing about a dozen of *C. porcellus* on each of six consecutive evenings.—HERBERT E. NORRIS; St. Ives, Hunts, July, 1883.

VARIETY OF ARGE GALATHEA; HESPERIA ACTÆON IN CORNWALL; EUPITHECIA TOGATA IN WILTSHIRE.—I took last year, near Marlborough, an odd variety of *A. galathea*, in which all the black markings were "Indian red," and the ground colour pale yellowish green. Some years back I took *H. actæon* in some numbers at Truro, Cornwall, in good condition and quite unmistakable; but have not seen it there since. Towards the end of June this year I took one *E. togata*, in good condition, at Severnake Forest; the red bands are very distinct.—E. F. BENSON; Addington Park, Croydon.

LYCÆNA ACIS IN SOUTH WALES.—In company with the Rev. C. T. Crutwell, I was fortunate in capturing a specimen of this rare butterfly in fair condition, flying over thyme, at Tenby. The following day I visited the spot again under most unfavourable circumstances, the wind blowing quite a gale. I saw a second specimen, and got it in the net; but being over careful in trying to box it, to my regret it slipped through my fingers, the wind taking it out of sight. Perhaps some of your correspondents can inform me if it has been taken before in South Wales, as I am under the impression that I have seen it recorded from there.—W. EDWARDS; Great Malvern, August 15, 1883.

[In Newman's 'British Butterflies' (p. 133) we read:—"Glamorganshire. In 1835, 1836, and 1837, I could take *Acis* in plenty, but have not seen it since.—*T. Parry*, *Merthyr 'Intelligencer'*, vol. vi., p. 28. Croesgid, near Llantrissant, rare.—*Evan John*. I have seen, but not taken, Glamorganshire specimens.—*J. T. D. Llewelyn*. Monmouthshire. I have taken one specimen at St. Julians.—*George Lock*." Mr. A. E. Hudd captured six specimens in South Wales in June, 1871 (E. M. M., viii. 113); and it has repeatedly been recorded in some numbers from the neighbourhood of Cardiff (Entom. viii. 161, 271; x. 5, 19; xi. 104).—E. A. F.]

DEILEPHILA LIVORNICA IN ESSEX.—A very large specimen of this fine hawk-moth was brought to me on July 30th, having been taken the day previous sitting in a cart-rut in the road outside St. James' Street Railway Station, at Walthamstow. It is now in the collection of Mr. J. A. Clark, of Hackney.—W. J. HARPER; 66, Mansfield Street, Kingsland Road, Aug. 16, 1883.

DEILEPHILA LIVORNICA IN BERKSHIRE.—I should like to record that I took a well-marked specimen of the above-named species on July 15th. It was dipping into flowers of *Pelargonium* in a greenhouse, at dusk.—F. WALKER; Oakley House, Abingdon.

VARIETY OF EPIONE VESPERTARIA.—I had the good fortune to net, on the morning of July 29th, an extraordinary variety of the very local *Epione vespertaria* at its haunt, near to this city. The border of the wings of the insect is of a very dark purple, with the central part of the wings (which in ordinary specimens is of an orange colour, with the vein-like markings dark red) of a deep brick-colour, the vein-like markings being absent. It is a very striking variety, and is in capital condition.—SAMUEL WALKER; 8, Neville Street, Haxby Road, York.

ABRAXAS ULMATA AT LEWES.—This species occurred at the end of June in a small wood on the chalk, close to this town. I had previously thought it to be, almost exclusively, an insect of the Midland Counties. It is, I believe, quite new to this district.—J. H. A. JENNER; 4, East Street, Lewes, July 21, 1883.

CIDARIA SAGITTATA IN WORCESTER.—Whilst collecting Lepidoptera in Bewdley Forest, on June 26th, I was astonished to find this beautiful *Geometra* flying over a swamy spot at dusk. I was fortunate enough to net seven fine specimens, evidently just emerged. This, I believe, is a fresh locality for it.—W. EDWARDS; Great Malvern, August 15, 1883.

BREEDING STAUROPUS FAGI.—Having bred a very fine series of the above-named species I gladly respond to Mr. J. Anderson's request in the 'Entomologist' (Entom. xvi. 182), with reference to its management while in the pupa state. My method, which I found most successful, was to place the whole of the pupæ out of doors during the winter, taking the precaution of covering them with a quantity of beech leaves: this will be seen to be the most natural way for them to pass that season. Upon the arrival of May I brought them into the conservatory, the temperature of which was very little above the average of that out of doors, and kept them slightly damped with water of the same temperature as the air in the conservatory, never allowing them to get dry. In a few days they began to emerge, and that with scarcely any failures. They will sometimes, if fed-up quickly, go through all their stages

and emerge the same season. Is it generally known that the young larvæ, although they eat nothing but their egg-shell before they undergo their first moult, drink copiously? When I bred my series it was my custom to sprinkle the food with water, and at first I was much surprised to find that they commenced upon the drops of water, looking like so many black ants around grains of sugar. I hope that the above hints may be useful to Mr. Anderson, and that he will be more successful next year.—H. JOBSON, sen.; 3, Clarendon Villas, Walthamstow, Aug. 20, 1883.

ABUNDANCE OF *SENTA ULVÆ*.—Whilst in Norfolk, last month, I came across *Senta ulvæ* in something like the numbers in which it used to be found. All varieties occurred, the plain ordinary form most commonly, of course; and then *bipunctata* and *nigrostriata* in about equal numbers and not uncommonly, with but one *wismariensis*. Insects were plentiful enough on favourable nights; but there was nothing else particularly worth noting, except perhaps the degenerate ways of *Nonagria brevilinea*, which I found in copulation with an enormous *Mania typica*; and Mr. Coben also found one in the same situation with *Celæna haworthii*. —G. W. BIRD; Hurley Lodge, Honor Oak, S.E., Aug. 15, 1883.

DESCRIPTION OF THE LARVA OF *PHYCIS ADORNATELLA*.—On the 10th of May last I received from Mr. H. B. Fletcher, of Worthing, some half-score larvæ of this species. They varied in length from three-eighths to five-eighths of an inch, the larger probably being nearly adult larvæ, and the smaller ones, which were proportionately more slender, younger specimens. The head has the lobes rounded; in the younger specimens it is about the same width, but in the older ones narrower than the 2nd segment; both it and the frontal plate are polished. Body cylindrical, and of almost uniform width; in the older examples tapering a little at the extremities. The segmental divisions are distinct, and a transverse depression on each segment gives to the skin a slightly wrinkled appearance. Ground colour of the younger specimens dull smoky black, but in the larger examples a strong tint of olive is distinctly seen through the black. Head brown, strongly freckled, and marked with very dark brown. A dark smoky black line, faintly edged on each side with slaty gray, forms the dorsal stripe; there are also two indistinct irregular lines of this pale colour between the dorsal and spiracular

regions, and a still fainter indication of the pale colour along the spiracles. In the young specimens these pale lines are scarcely discernible, even with a lens. In the young specimens the frontal plate is black, but in the older ones the olive tint shows through it also. Ventral surface and prolegs uniformly dark smoky blackish olive, the anterior legs tipped with black. Feeds on wild thyme. No imagines emerged from my larvæ; but Mr. Fletcher fortunately bred several from those he kept.—GEO. T. PORRITT; Huddersfield, August 8, 1883.

CAPTURE OF CRAMBUS MYELLUS.—Mr. William Herd has asked me to record for him the capture of two specimens of this pretty Crambus. He took them in Glen Tilt in July, and saw two other specimens, which escaped his net. Though *Crambus myellus* still remains amongst the rarer British species, it is probably because its habits are insufficiently known. The first British specimen was taken in Glen Tilt many years ago; but the first recorded one was taken near Aberdeen in 1868. It seems not to have been met with again till I took three specimens in Braemar; and though I think it has been reported from Rannoch, more details of the capture of the latter specimens are desirable before we can accept them. Mr. Herd's specimens were taken flying in the afternoon, while mine came to light. Mr. Herd has obtained a few eggs, so it is to be hoped that some light may be thrown on the life-history of the species.—F. BUCHANAN WHITE; August 7, 1883.

PHLEODES IMMUNDANA.—Whilst returning from St. Michael's on the Wyre, about 7 o'clock last evening, I saw a lot of small moths flying from a tall alder tree. Fortunately two nets and a satchel full of boxes were in the carriage bottom. My wife had boxes ready, and my son and I had warm work of it, throwing sticks up at the boughs: some came down, and others soared upwards. However, in twenty minutes we boxed over forty specimens, the greater part being females. Having ten miles to drive and no lamps, made us leave earlier than we wished. Had it occurred to me to stand in the carriage and catch them while flying round the twigs, no doubt twice as many could have been secured. I have only taken odd specimens before. There are two broods in the year of this species.—J. B. HODGKINSON; Preston, August 20, 1883.

CRYPTORRHYNCHUS LAPATHI, *Linn.*.—About two months ago the owner of a withy-bed drew my attention to many of his two-year-old withies, which were lying prostrate after a heavy gale. On examining the place where the withy was broken, I discovered that the wood had been eaten away into the centre of the stem, and on splitting the stick the culprit was discovered in the shape of a fine fat white maggot, which was feeding on the pith. By the time this larva was full-fed it had consumed about one inch and a half of the pith. I brought home about thirty pieces, and last week I opened them, and each contained a fully-developed beetle. Can any of your readers say when the beetles would have emerged, or when and where the eggs are laid? It appears to me from the size, &c., of the entrance, that it must have left some other tree; yet there did not appear to be any old tree near affected by them. I should not have disturbed them, but was very anxious to see if one was likely to produce an ichneumon, but I am sorry to say they all turned out beetles. In Cox's 'Handbook of Coleoptera,' vol. ii., p. 142, the scales mentioned therein as white, in my specimens are a beautiful pink. This may be owing to my prematurely removing them from their hiding-place; or are they pink when they first emerge, and soon get bleached to the colour mentioned?—G. C. BIGNELL; Stonehouse, Plymouth, Aug. 9th.

OBSERVATION ON THE TERMITES OF RANGOON.—As a record of an incident in the habits of the white ant coming under my own observation, I venture to lay this short note before the readers of the 'Entomologist.' The specimens and a note were laid before the Linnean Society on June 7th, 1883. About the middle of November, 1882, I noticed a cloud of termites flying about the stair of my bungalow. I found they were issuing from the ground near a termitarium under the stair. I was able to watch the process of their exit from the nest. The ground at some distance from the hill would suddenly open, and a crowd of workers appear, who seemed to be enlarging the opening. Immediately after came the long-legged males in an incessant stream, taking to flight as fast as they could spread their wings, many falling again to the ground, when they became the prey of the ants. This had not gone on for more than three or four minutes when a couple of toads appeared, and stationing themselves by the openings whence the termites issued swallowed them as fast as they appeared, while those that escaped into the

air were chased by the numerous bats that found their way to the spot as quickly as the toads. Sometimes they would cease to issue from a hole, when another would be opened by the workers. Next day I tried to open the nest. I found that all the holes whence the termites had crept had been filled up, as well as the passages with which they communicated, by the workers; and the new part had hardened so quickly that I was unable to trace the direction of the passages. The remarkable point about this is the season at which it occurred. These insects make their appearance in myriads about the beginning of the rains. The Queen's Birthday ball, at Gort House, was one year lately interrupted by them; but I have never heard of them appearing in November. The specimens sent for identification are a male, a female, and a worker, from the nest, which swarmed on November 8th, 1883, at Rangoon.—ROBERT ROMANIS.

[Mr. M'Lachlan, to whom these have been shown, says that—judging from the specimens sent, which unfortunately were injured in carriage—the species appears to be *Termes taprobanes*, Walker, or one closely allied thereto.]

NOTE ON A NEW ZEALAND ICHNEUMON.—I have observed the following curious circumstance in connection with the habits of *Ichneumon perfidiosus* on two separate occasions, and have but little doubt that it is universal. I am unable to account for it in any other way; but perhaps some of your readers, who make the economy of these insects their especial study, may readily be able to explain it. While out collecting in the neighbourhood of Wellington, on January 14th last, I observed a number of this fine species flying in and out of a crack in the bark of a large black pine. Being desirous of discovering what attracted them, I removed a large portion of the bark, and found that there were over sixty insects crowded together in the hollows and irregularities underneath. I captured several, and examined a great number of them, and found them to be all females. There was no difficulty in doing this, as the most cursory glance could not fail to detect their short ovipositors. There was no nest of any kind, the cavity being a natural one, the ichneumons not having improved on it in any way. On the other occasion I found a number of these insects under exactly similar circumstances, about five miles from here, but there were none flying round the tree. They were, as before, all females, and seemed torpid, which

was no doubt owing to the coldness of the weather. This, however, cannot be the cause of their congregating, as on the former occasion it was during the hottest weather that they were found. The only male I have ever seen was captured on a shrub during last November, and not near any black pines.—GEO. VERNON HUDSON; Palmerston, North, June 13, 1883.

REAPPEARANCE OF PHOSPHÆNUS HEMIPTERUS, *Geoff.*, AT LEWES.—This interesting beetle has again occurred at Lewes. Several specimens have been taken by my friend Mr. C. H. Morris, of this town, in his garden, and by his kindness I have been able to see the insect in a living state. The locality is not far from the place where Miss Hopley took the first British specimens in 1868. The first specimens were seen this year on June 17th, and so far only males have occurred. The insect is very active by day, crawling quickly over walls, &c.; but it readily feigns death, contracting the limbs close to the body, and falling to the ground. The males are decidedly luminous, the light proceeding from two spots on the apical segment of the abdomen, both above and below. As in the glow-worm, the light is produced at the will of the insect, and when not visible a little irritation will generally render it so. This would make it probable that the light, at least in the male, is not used as a sexual attraction, but as a means of frightening its enemies, and warding off danger. Since I formed this conclusion I have had the opportunity of observing both males and females of *Lampyris noctiluca*. In the males of this species the light is produced almost exactly in the same way as in the male *Phosphænus*, but usually the light is very feeble and hardly visible. I have found, however, that irritation will almost invariably produce it brilliantly. In the female *Lampyris* the light is more involuntary, and I have only partially succeeded in producing by irritation a re-illumination. These facts seem to show that the light of luminous insects is primarily a protection from danger; thus in the female glow-worm absence of wings having rendered it more helpless than the male, the light—the means of defence—has in a corresponding degree developed. At present I have had no opportunity of seeing the female of *Phosphænus hemipterus*.—J. H. A. JENNER; 4, East Street, Lewes, July 21, 1883.

ERRATUM.—Entom., vol. xvi., p. 188, line 12 from foot, for "*Epione vespertaria* which was getting over," read "*Epione vespertaria* which was getting well out."—G. T. P.

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LIFE-HISTORY OF *VANESSA GONERILLA*.

BY GEO. VERNON HUDSON.

ONE of the commonest, and at the same time one of the most beautiful, of the very limited Rhopalocerous fauna of New Zealand is *Vanessa gonerilla*.

The following paper, which treats of the life-history of this insect, will I trust be of some interest to the readers of the 'Entomologist.'

The eggs in shape are almost exactly like those of *V. urticæ*, being of a light green colour with the ribs white, and are deposited on the leaves of a dwarf species of stinging nettle, which grows in moderately open spots in the forest, amongst the numerous ferns. It is by no means common, and is therefore very difficult to find.

The young larva, upon its emergence from the egg, is of a dusky straw colour, with the spines and head black. I am not sure of the exact duration of the first period of its life, as the only specimen I reared from the egg died two days after it emerged; but it is probably not longer than a week before its first moult occurs. During its second stage it is of a nearly uniform brown colour, the subdorsal and lateral lines being but faintly indicated. In about ten days it prepares to change its skin for the second time, constructing for that purpose a small dwelling out of a rolled leaf, which it devours when this operation is completed. After moulting, no great alteration is observable in the colouring of the larva, the stronger appearance of the white lateral lines being the most conspicuous feature. In another two weeks the third and last moult takes place, which is performed in a similar manner, and after this the brood contains no less than

four distinct varieties which are described below, the rarest taking precedence.

Of the first variety the general colour is a pinky gray, sub-dorsal line very distinct, white, with a black bar beneath it on each segment; head, belly, legs and spines, light green; there is also a conspicuous white lateral line, dividing the green from the gray, which has above it a bold black line, the space between this and the above-mentioned black bars being strongly clouded with darker gray. This variety, in common with all the rest, possesses no spines on the first segment, there being seven on the others, viz., a row down the back and three on each side, the last of all having only two spines.

Of the second variety the markings are the same as in the first in every respect, except that the ground colour is of a brownish pink tint.

The third variety has the back and sides dark brown, sub-dorsal lines reduced to a chain of white bars, lateral lines distinct; head, belly, legs and spines green.

In the fourth the markings resemble the third, except that the ground colour and head are black, the belly and legs dark brown, the prolegs green, and the spines shining black.

I am at a loss to explain the cause of this singular variation, and can only state that it was not connected with a difference in food, sex, or any other external circumstance.

After these had gone through the wonderful performance of changing into pupæ they consisted of two varieties, one of a uniform light brown colour, the other black, with the dorsal half of the abdomen dark brown, the spines and extremities of the wing-cases being tawny. Both these varieties had in some cases a few gold or silver metallic spots on the prominent parts of the body. The different larval varieties changed into the two kinds of pupæ quite indiscriminately, with the exception of the first two, both of which resulted in the light brown form; but as I had but one example of each of these, it was very possibly wholly accidental.

The time between the third moult and the larva's final transformation is a little over a fortnight, the duration of the pupa state itself being from twelve to sixteen days.

I was not so much surprised at the variation of the pupæ, as I had a similar experience when rearing a number of *V. urticae* in

1880, the pupæ of which consisted of six distinct varieties. This great diversity in the colouring of the chrysalis of this species must have been noticed by anyone who has reared it, although in all the standard works with which I am acquainted, but one description is given.

The larvæ of *P. gonerilla* are gregarious in their habits, but differ from the European species in resting and feeding on the under surfaces of the leaves, exposing as little of their bodies to view as possible. The pupa must be very closely concealed, for with the most careful searching, in places where I knew the larva had fed up, I was unable to find one. All my pupæ were taken when in the caterpillar state, and kept till they changed.

The perfect insect occupies an unusually short time in drying its wings, four hours being all that is mostly required, and on fine days it frequently was fluttering after having emerged but three hours. It is very powerful on the wing, flying against the most violent winds, and, indeed, if it were not it could never venture out at all, for in many parts of the islands it is always blowing hard.

This insect is common from February to April in most situations, but the greatest numbers are to be found in the spring months. These hibernated specimens appear as early as August, and have not all disappeared before the end of December, or middle of January, when the earliest of the new ones are just appearing. In fact, it is not unfrequent at this time to take both hibernated and recent specimens together. This species is a great traveller, seldom settling, and mostly seen flying over the tops of the trees at a great rate. It shows a singular indifference to shadow, as it is constantly flying out of the sunlight into shady places in the bush, probably in search of the food-plant of the larvæ.

Palmerston North, Manawatu, N.Z., July 13, 1883.

A SHORT VISIT TO DOVER.

BY GEORGE COVERDALE.

EARLY in July I left London one afternoon for a few hours' collecting on the S.E. coast, and arrived at my destination by six o'clock. The weather was everything that could be desired, the very boisterous wind had given place to a dead calm, and the still hot evening sunshine blazed on the opposite coast of France,

which through the clear air seemed but a mile or two away. Never in the course of my experience have I found Lepidoptera in such abundance and variety. On going through the town *Vanessa cardui* was flying commonly about the streets, their numbers, however, being but a faint indication of the hundreds, one might almost say thousands, to be met with later on. Seeing such a favourable state of affairs, I determined to make the most of it; and so worked that evening, and right through the night and all the following day, getting about twenty-five hours' continuous collecting. By seven o'clock the next evening my boxes were full, and I was somewhat thirsty.

In the following pages I shall venture to enumerate some of the species which fell to my net, as an encouragement to others who may contemplate working this well-known but by no means exhausted coast. Among the Diurni, *Argynnis aglaia* was common and in fine condition, being partial to flowers of *Centaurea nigra*. *Vanessa cardui* in large numbers, but bad condition. Fresh specimens of *V. atalanta* and *V. io* were on the wing, and *Arge galathea* was very common; *Satyrus hyperanthus* and others of the genus were visible, and I saw several worn specimens of *Thecla rubi*. *Lycæna alsus* could be counted in hundreds, and *L. corydon* was just emerging. *Hesperia sylvanus* and *H. linea* were common.

Macroglossa stellatarum visited the flowers of *Echium vulgare* in great numbers in the evening, and again in the early morning sunshine. *Hepialus humuli* was flying commonly at dusk and just before sunrise, but not throughout the night. *Zygæna filipendulæ* was extremely abundant as larvæ, pupæ, and imagines. *Nudaria senex*, *Setina irrorella*, and *Lithosia complana* put in an appearance, and *Callimorpha dominula* was continually tumbling into the net, its larvæ being plentiful on various plants. *Euchelia jacobæ* also occurred. Larvæ of *Liparis chrysorrhæa* were not uncommon on *Hippophae rhamnoides*. The females of *Odonestis potatoria* I found commonly at rest on the grass, side by side with its larva.

Among the Geometræ were *Ourapteryx sambucata*, *Acidalia scutulata*, *A. incanaria*, *A. immutata*, and *A. promutata*; and I observed that *Emmelesia albulata* was rather common amongst *Rhinanthus crista-galli*, and the capsules of *Silene inflata* produced larvæ of *Dianthæcia capsicola* and *Eupithecia venosata*. The other pugs met with were *E. centaureata*, *E. subumbrata*, *E.*

absynthiata, and *E. isogrammata* from *clematis*, from which was also obtained *Melanippe procellata* and *Phibalapteryx tersata*. *M. galiata* and *M. rivata* were common. Specimens of *Eubolia mensuraria*, *E. bipunctaria*, and *E. lineolata* turned up, the latter in abundance.

Of the Noctuæ, most of which were observed throughout the night feasting on the flowers of *Echium vulgare*, &c., there were *Leucania conigera*, *L. lithargyria*, *L. comma*, &c., *Xylophasia sublustris*, *Mamestra anceps*, *M. furva*, *Miana literosa*, *M. furuncula*, *Caradrina morpheus*, *C. blanda*, *C. cubicularis*, *Agrotis aquilina*, &c.; *Triphæna interjecta*, *Eremobia ochroleuca*, *Hadena chenopodii*, *Heliothis marginata* (very difficult to get in good condition), and *Plusia gamma*, rushing wildly about both morning, noon, and night. Of *Heliothis peltigera* I took two specimens flying round *Reseda lutea*, and a single worn representative of *Acontia luctuosa*. *Euclidia mi*, *E. glyphica*, and *Phytometra ænea* were met with.

Among the Pyralides I took a few each of *Pyralis glaucinalis*, *Pyrausta punicealis*, *P. ostrinalis*, *Herbula cespitalis*, and *Ennychia anguinalis*, besides single specimens of *Cledeobia angustalis*, *Spilodes palealis*, *S. cinctalis*, and *Stenia punctalis* (from *Iris fœtidissima*). The other Pyrales were *Cataclysta lemnalis*, *Hydrocampa nymphæalis* (very common); and *Botys fuscalis*, *Ebulea crocealis*, *E. sambucalis*, and *Pionea forficalis* from the wild cabbage; and *Scoparia cembralis* was common amongst *Clematis vitalba*.

I took the following Crambites:—*Platytes cerussellus*, *Crambus perlellus*, *Homœosoma sinuella*, *Phycis adornatella*, *P. subornatella*, *P. ornatella*, and a couple of *Oncocera ahenella*.

The Tortrices came well to the front, being represented by *Tortrix costana*, *T. icterana*, *Penthina ochroleucana*, *P. sellana*, *Sericoris cespitana*, *Peronea rufana*, *Orthotænia striana*, *Eriopsela fractifasciana*, *Sciaphila perterana* (very abundant and variable, especially the females), *Sphaleroptera ictericana*, *Grapholitha nigromaculana*, *Hypermercia cruciana*, *Ephippiphora brunnichiana*, *E. trigeminana* (common), a few *Endopisa nigricana* in a pea-field, besides which was *Stigmonota leplastriana* flying in the sunshine amongst the cabbage in considerable numbers, but difficult to obtain owing to their rapid movements and the rough nature of the locality. *Achillea millefolium* produced *Dicrorampha petiverana* in plenty, and the *Ononis* was in some places teeming with

Catoptria microgrammana; all, however, much the worse for wear. *C. hypericana*, *C. hohenwarthiana*, and *C. scopoliana* were met with. *Eupæcilia rupicolana* and *H. angustana* were very common. *E. hybridellana* scarce, and a single *E. atricapitana* was taken. The remaining Tortrices were *Xanthosetia hamana*, *Chrosis tessera* (swarming), *Argyrolepis baumanniana*, *Conchylis francillana* (common), *Sciaphila alternana*, *C. inopiana* (a few from *Inula dysenterica*), and *Aphelia osseana* (common). Before leaving the Tortrices I ought to mention that a species occurred amongst *Onobrychis sativa*, &c., which has since been identified as *Grapholitha cæcana*, and described in the 'Entomologist' (Entom. xvi. 195).

As the list is growing long, I will only mention a few of the Tineæ. From an old stack came *Scardia arcella*, *Tinea rusticella*, *T. albipunctella*, *Nemotois minimella* (dancing in the sunshine); *Plutella xylostella* was swarming everywhere, in some places where I could see no Cruciferæ; *Depressaria liturella*, *D. nanatella*, *D. alstroëmeriella* (larva from *Conium maculatum*, and that of *Plusia gamma* from the same plant), *Gelechia cinerella*, *G. rufescentella* (common), *G. populella*, *G. desertella*, *G. acuminatella*, *D. ocellella*, *G. sequacella*, *G. tenebrella*, *G. anthyllidella*, *G. bifractella*, *G. pictella*, and *G. subocellella*, *Parasia neuropterella* and *P. lappella*, *Anarsia spartiella*, *Nothris durdhamella*, *Sophronia parenthesella*, *Butalis senescentella*, *Glyphipteryx fischeriella* (in hundreds), *Douglasia ochnerostomella*, common amongst *Echium vulgare*, in company with *Coleophora onosmella*; this latter species was also taken amongst *Lycopsis arvensis*. On *Eupatorium cannabinum* the cases of *C. troglodytella* abounded, and a few *C. litella* and *C. albitarsella* turned up. *Laverna* was represented by *L. miscella* and *L. epilobiella* (larva). *Chrysocoris festaliella* and *Antispila treitschkiella* put in an appearance; and *Elachista cygnipennella*, *E. biatomella*, and *E. triatomella* were found in some numbers. Amongst the plumes were *Pterophorus bertrami*, *P. acanthodactylus*, *P. parvidactylus* (common), *P. phæodactylus*, *P. serotinus*, *P. plagiodactylus*, *P. lithodactylus*, *P. lienigianus*, *P. microdactylus* (common), *P. baliodactylus*, *P. tetradactylus* (common), *P. pentadactylus* (swarming), &c.

The expedition resulted in the capture of over three hundred specimens, and this number could easily have been doubled but for want of pill-boxes. As it was, several *A. aglaia* had to be packed in one box, and four or five *M. stellatarum* in another, an operation

not calculated to improve their condition; for one of the number becoming rather lively on the way home added nothing to his own appearance, and nearly spoilt his neighbours'. Looking through my journal I see that 220 species were observed during the trip, and many others must have been overlooked in so hasty a visit, making about the best day's collecting I ever remember.

24, Fleming Road, Lorrimore Square, S.E., August 15, 1883.

A WEEK AT WITHERSLACK.

BY ARTHUR J. ROSE.

DURING the early part of July I spent a week at that delightful place known as Witherslack. I had never been northward for an entomological trip, so after reading the many accounts by Mr. Hodgkinson in this Journal I decided to spend a part of my annual holiday there. On my way I had the pleasure of calling upon that gentleman, who with his wonted kindness gave me much useful information.

On arriving at Grange-over-Sands, a very delightful seaside place on the north-east shore of Morecambe Bay, Witherslack may be found about four miles on the Kendal Road. It is a straggling little village, surrounded by rocky broken ground, mountains, and moorland. I was much struck with the profusion of flowers, which gave the place the appearance of a good entomological locality.

My first outing was to the Moss nearest the Inn, and the day being warm, although dull, I found *Chortobius davus* flying pretty freely and in splendid condition. The surface of the Moss is, however, very uneven, and it is quite useless to attempt to chase an insect which you have missed, and in addition you run the risk of an accident. *Aspilates strigillaria* and *Acidalia fumata* were flying over the heath in plenty, with an occasional *Anarta myrtilli* and *Scodiona belgiaria*, and I also knocked up a few *Euthemonia russula*. About the third day of my stay *Hyria auroraria* began to emerge, and I captured during my sojourn there some fifty specimens in lovely condition. I tried sugar in the evenings, but with absolutely no success, and I contented myself with dusking round some old yew-trees on the bank near the Inn. Here I obtained a good series of *Eupithecia constrictata*

and a few *Cidaria fulvata*, *C. pyraliata*, *Emmelesia affinitata*, *Anaitis plagiata*, and *Caradrina cubicularis*; while on all the walls in the neighbourhood the larva of *Nudaria mundana* was in abundance. On this same bank in the daytime I captured a nice series of *Lycæna salmacis*, several *A. plagiata*, and two *Photedes captiuncula*. *L. alsus*, judging from the number of faded specimens, had been plentiful. By searching the rocks on broken ground where the foxglove abounded *E. pulchellata* was to be found, and also *Pseudoterpna cytisaria*; and at dusk in the locality there were a few *Hepialus velleda*. I visited this place as early as seven o'clock in the morning on two occasions, and found *Argynnis adippe* on the wing.

I then started off for a tour of the English lakes, being also desirous of obtaining *Erebia epiphron* from one of the many localities in which it exists and through which I should pass. However, at Red Screes Mountain, one of its head-quarters, nothing but rolling clouds and pelting rain was forthcoming, and during my ascent of Helvellyn the weather was not much more favourable. At the foot of Griesdale Tarn *Tanagra chærophyllata* was in great plenty flying among the long bracken, and indeed on most of the mountains I found this insect abundant and in good condition. Here I was pleased to take a species of the *Geometræ* new to me, viz. *Coremia munitata*, and I searched about for some time without meeting with another specimen. However, about two days later, while nearing the summit of Skiddaw, some 3000 feet above sea-level, I again saw several, but having no net I only succeeded in boxing two or three. The weather was very stormy and unsettled, but I am convinced that anyone having a companion with him might do very well on the mountains; but it would be wretched work alone. I searched thoroughly for *E. epiphron* in the neighbourhood of Langdale Pikes, but with no success. I believe one must know the exact spot for it, as the mountain chain is very extensive at that part.

I then returned to Witherslack for three days, having previously searched some hours in vain after *E. tæniata*, but again the weather did not allow me to obtain it. On the Moss at Witherslack I found that during my week's absence *A. fumata*, *A. strigillaria* and others were quite over; but *Carsia imbutata* was fresh from the chrysalis, and I obtained a beautiful series of this pretty insect. By beating the birch-trees I obtained two

Platypteryx falcata and one male *Geometra papilionaria*. I observed large numbers of the larva of *Bombyx callunæ* sunning themselves on the heaths, but they were all ichneumonised. On the bank facing the Inn *A. aglaia* was flying in plenty, and without any trouble I caught two dozen in one morning.

As many of my friends who have spent their holidays in the South of England met with much disappointment, I hope that the above notes will prove of interest to some of the readers of the 'Entomologist'; and although the list of captures is not extensive, yet it will show that species were not totally absent, as has been the case in the New Forest.

36, Bodney Road, Hackney Downs, E., August 25, 1883.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. III.—CRYPTIDÆ (*continued*).

PEZOMACHUS, *Grav.*

DIVISION 1.—Aculeus at the most not much longer than the 1st segment of abdomen.

A. Metathorax without a transverse ridge separating the upper from the back or slanting part.

I. Abdomen densely covered with hairs, and their pits.

a. Abdomen with coarse punctures.

* Abdomen entirely red. - - 1. *vulpinus*, $1\frac{1}{2}$ —2 lines.

** Abdomen black from the 2nd segment. - - 2. *Neesii*, 2 lines.

b. Abdomen with fine punctures.

* Upper part of the metathorax very short.

† Spiracles of the 1st segment of abdomen projecting.

Base of antennæ, thorax, segments 1st and 2nd, and legs, red.

3. *Ratzeburgi*, $1\frac{1}{2}$ line.

†† 1st segment of abdomen with spiracles not projecting.

‡ Mesothorax without a trace of scutellum.

Insects black, legs piceous.

§ Mesothorax and metathorax of equal lengths. - *hieracii*, $1\frac{1}{2}$ line.

§§ Metathorax about half as long as the mesothorax. 4. *tener*, $\frac{3}{4}$ line.

†† Mesothorax with indications of a scutellum.

Insect black-brown. - - - 5. *festinans*, $\frac{4}{5}$ —1 line.

** Upper part of the metathorax not unusually short.

× Mesothorax longer than the metathorax.

Insect black. - - - 6. *anthracinus*, 1 line.

×× Mesothorax not longer than the metathorax.

o Greater part of insect reddish yellow.

Head, three bands on abdomen, apex of antennæ, and apex of hind femora and tibiæ, dark. - - - 7. *zonatus*, $1\frac{1}{2}$ line.

oo Insect almost entirely black-brown.

→ 1st segment of abdomen yellow. - - - 8. *timidus*, $\frac{3}{4}$ line.

+ + 1st segment of abdomen black brown. - - - *nigritus*, 1 line.

II. Abdomen clothed with scattered hairs.

a. Metathorax very short; insect piceous.

* Mesothorax of ordinary length. - - - 9. *pumilus*, $\frac{4}{5}$ line.

** Mesothorax as short as the metathorax. - - - *brevis*, 2 lines.

b. Metathorax of ordinary length.

† The fourth joint of antennæ longer than the third.

†† Thorax red.

Legs and base of abdomen red. - 10. *Kiesenwetteri*, $1\frac{1}{2}$ — $2\frac{1}{4}$ lines.

††† Thorax and abdomen black.

§ Legs red; aculeus quite as long as 1st segment of abdomen.

11. *ecarinatus*, 1 line.

§§ All the femora and hind tibiæ more or less brown; aculeus at least one-fourth shorter than the 1st segment. 12. *forticornis*, $1\frac{1}{2}$ line.

†† The third joint of antennæ as long as the fourth, or a little longer.

Brown, legs yellow; 1st segment of abdomen and femora brownish yellow. - - - 13. *posthumus*, $\frac{3}{5}$ line.

B. Metathorax with a more or less distinct transverse ridge, which separates the upper from the back or slanting part.

I. The slanting part (or that portion below the transverse ridge) much shorter than the upper part.

a. Abdomen clothed with dense pubescence.

Black, legs red; thorax elongate. - - - 14. *nigricornis*, $1\frac{1}{2}$ line.

b. Pubescence on abdomen scattered, not dense.

* Legs entirely red.

Base of antennæ, thorax, 1st two and part of 3rd segments, red.

15. *bellicosus*, $2\frac{1}{4}$ lines.

** Legs not entirely red, but more or less brown; thorax red.

† 1st segment of abdomen red. - - - 16. *pulicarius*, $2\frac{1}{5}$ lines.

†† 1st two segments of abdomen red. - - - 17. *acarorum*, $2\frac{1}{5}$ lines.

II. The posterior or slanting part of the metathorax of ordinary length, or long.

1. Pubescence on the abdomen dense, at least on the three 1st segments.

a. Aculeus about as long as the 1st segment.

* Spiracles on the 1st segment of the abdomen distinctly projecting.

Antennæ, thorax, 1st two and part of 3rd segments and legs, red.

Hemimachus trux, $1\frac{1}{2}$ line.

** Spiracles on the 1st segment not distinctly projecting.

† Abdomen, as well as thorax and legs, entirely red, or reddish yellow.

†† Head red, or reddish yellow.

§ Head darker than the thorax. - - - 19. *carnifex*, $1\frac{1}{2}$ line.

§§ Head not darker than the thorax. - - - 20. *rufulus*, 2 lines.

††† Head black.

× The 1st segment of the abdomen with slightly but distinctly projecting spiracles; the sheaths of the aculeus brown at the apex.

21. *ochraceus*, $1\frac{1}{4}$ line,

× × The 1st segment without projecting spiracles; sheaths of the aculeus entirely brown. - - - 22. *corruptor*, $1\frac{1}{2}$ line.

- †† Abdomen not entirely red.
 o The 1st segment only red, or reddish yellow.
 + Metathorax much longer than the mesothorax.
 Thorax and legs reddish yellow. - - - 23. *modestus*, $1\frac{1}{4}$ line.
 + + Metathorax not much or not at all longer than the mesothorax.
 ++ Hairs on the apical portion of the abdomen somewhat scattered.
 Thorax and legs red. - - - - - ? *distinctus*, $1\frac{1}{4}$ line.
 +++ Hairs on the apex of the abdomen not scattered.
 ∞ Mesothorax with an imperfectly defined scutellum.
 Thorax more or less red or brown; legs partly brown.
 ? *intermedius*, $1\frac{3}{4}$ line
 ∞ Mesothorax without a scutellum.
 Middle and hinder tibiæ more or less marked with brown at the apex
 and before the base; antennæ dark red, or brown-red.
 ! Thorax light red; 1st segment of abdomen the same colour.
 Mülleri, $1\frac{1}{4}$ line.
 !! Thorax dark red or brown; 1st segment lighter. - *incertus*, 1 line.
 oo The 1st two segments red.
 Head lighter or darker red.
 Reddish yellow; 3rd and 4th segments of abdomen brownish.
 juvenilis, 1 line.
 ooo The 1st three or four segments red.
 Base of antennæ, thorax and legs, red; hind knees and apex of hind
 tibiæ brown. - - - - - *xylochophilus*, $1\frac{1}{2}$ line.
 b. Aculeus longer or shorter than the 1st segment of the abdomen.
 a. Aculeus shorter than the 1st segment.
 * Thorax and abdomen black.
 Base of antennæ and legs red. - - - - - 24. *agilis*, $1\frac{1}{4}$ line.
 ** Thorax and abdomen not entirely black; the metathorax not, or but
 little, longer or shorter than the mesothorax.
 † 1st segment of abdomen with distinctly projecting spiracles.
 Thorax with an imperfectly-formed scutellum.
 Base of antennæ, thorax, 1st segment of abdomen and legs, red.
 25. *bicolor*, almost 2 lines.
 †† Spiracles on the 1st segment of abdomen not, or scarcely, protruding.
 † Thorax entirely red.
 Black-brown; base of antennæ, thorax, 1st three segments of
 abdomen and legs, red. - - - - - 26. *viduus*, $1-1\frac{1}{2}$ line.
 †† Thorax partly red and partly brown; without a trace of scutellum.
 1st segment of abdomen without projecting spiracles.
 § Red; head, apex of antennæ, metathorax, and abdomen from the
 3rd segment, black.
 Aculeus hardly half as long as the 1st segment.
 micrurus, $1-1\frac{1}{4}$ line.
 §§ Black; base of antennæ, prothorax and mesothorax, petiole and
 legs, red.
 Aculeus somewhat shorter than the 1st segment.
 27. *providus*, $1-2$ lines.
 b. Aculeus distinctly longer than the 1st segment; thorax red.
 * 1st segment only of the abdomen red.
 Base of antennæ and legs red. - - - - - 28. *cautus*, $1\frac{1}{2}$ line.
 ** 1st two segments red.

- Antennæ and legs red. - - - - 29. *transfuga*, $1\frac{1}{2}$ line.
2. Pubescence on the abdomen scattered.
- a. Thorax entirely or greater part black.
- a. Aculeus as long as, or scarcely longer or shorter than, the 1st segment of the abdomen.
- × Seventh joint of the antennæ longer than broad.
- * Abdomen black; only the 1st segment more or less red.
- † Prothorax, petiole, and the segments, narrowly red-margined; the legs red, hind ones partly brown.
- Hemimachus instabilis*, $1\frac{1}{4}$ —2 lines.
- †† Thorax more or less red or brown, also the 1st segment; legs red and brown. - - - - 31. *detritus*, $\frac{4}{5}$ line.
- ** At least two of the abdominal segments red.
- † Mesothorax red.
- Black; base of antennæ, 1st two segments of abdomen, and legs, red.
32. *pedicularius*, 2 lines.
- †† Thorax entirely black.
- Antennæ, 1st to 3rd segments of abdomen, and legs, red.
33. *cursorius*, 2 lines.
- b. Aculeus shorter than the 1st segment.
- Black; base of antennæ, prothorax, mesothorax, 1st, 2nd, and base of 3rd segments of abdomen, and legs, red; hind femora brown.
- × × Seventh joint of antennæ just as broad as long.
34. *vagans*, 1—2 lines.
- Black; base of antennæ, apex of all the segments, and legs, red.
30. *spurius*, $\frac{4}{5}$ line.
- b. Thorax entirely or greater part red.
- a. Aculeus as long, or about as long, as the 1st segment.
- * 1st segment of abdomen red.
- Black-brown; base of antennæ, thorax, and legs, dirty yellow.
35. *gracilis*, 1 line.
- ** Several of the segments of the abdomen red.
- † Seventh joint of the antennæ not, or hardly, longer than broad.
- Base of antennæ, thorax, segments 1st to 3rd, and legs, red; hind femora brownish. - - - - 36. *latrator*, 1 line.
- †† Seventh joint of antennæ distinctly longer than broad.
- † Abdomen red, with only one segment black.
- 3rd segment black; legs red. *Hemimachus fasciatus*, $1\frac{3}{4}$ —2 lines.
- †† 1st to 3rd segments of abdomen red.
- Thorax without scutellum; 1st segment of abdomen with projecting spiracles: base of antennæ, thorax, and legs, red.
37. *lepidus*, 1 line.
- b. Aculeus longer or shorter than the 1st segment.
- × Aculeus decidedly shorter than the 1st segment.
- * Thorax, 1st segment, and greater part of legs, red.
38. *Stevenii*, 2— $2\frac{1}{4}$ lines.
- ** Base of antennæ, thorax, 1st four segments, and greater part of legs, red. - - - - 39. *canaliculatus*, $1\frac{1}{2}$ line.
- × × Aculeus decidedly longer than the 1st segment.
- Line on the metathorax faint.
- Base of antennæ, thorax, 1st two or three segments, and legs, red.

- * Legs entirely red. - - - - - 40. *insolens*, 1½ line.
** Apex of the hinder femora, middle and hinder tibiæ, brown.
geocharis, 1⅓ line.

DIVISION 2.—Aculeus a little more than half the length of the abdomen.

- Black; thorax and petiole red. - 18. *Hoffmanseggii*, 2 lines.
- A. Mesothorax without a scutellum.
The 1st segment of abdomen with the spiracles projecting; reddish yellow, the head and abdomen from the 3rd segment black.
Hem. avidus, 1 $\frac{3}{8}$ line.
- B. Mesothorax with a distinctly defined scutellum.
- a. The 1st segment of abdomen with the spiracles projecting very much. Head much broader than the thorax; transverse ridge of metathorax distinct from side to side; the back part of the metathorax somewhat shorter than the upper part.
Black-brown; base of antennæ, prothorax and part of mesothorax, 1st and 2nd segments of abdomen, and legs, red.
41. *lustrator*, 1 $\frac{1}{4}$ line.
- b. The 1st segment of abdomen with the spiracles moderately projecting.
* Legs black-brown.
Black. - - - - - 42. *anguinus*, $\frac{4}{5}$ line.
- ** Legs reddish yellow.
Reddish yellow; head and abdomen from the 3rd segment black.
43. *insidiosus*, 1 $\frac{3}{8}$ line.
- c. The 1st segment of the abdomen with the spiracles not projecting.
* Insect very narrow and elongated.
Black; legs partly piceous. - - - 44. *linearis*, 1—1 $\frac{1}{8}$ line.
- ** Insect broader.
† Abdomen with scattered pubescence.
Black; base of antennæ, part of prothorax, apex of 1st and 2nd segments, and legs, reddish yellow. - 45. *indagator*, 1 $\frac{1}{4}$ line.
- †† Pubescence on abdomen not scattered.
‡ Abdomen black, or no segment entirely red.
Black; base of antennæ, part of mesothorax, apex of 1st and 2nd segments partly, and legs, reddish yellow. 46. *ageletes*, 1 $\frac{3}{8}$ line.
- †† Abdomen with at least one segment entirely or greater part reddish yellow.
Metathorax with a distinct transverse ridge.
- § No segment entirely yellow.
Black-brown; base of antennæ, part of thorax, 1st and 2nd segments of abdomen, and legs, reddish yellow. - ? *conveniens*, 1 $\frac{1}{2}$ line.
- §§ The 1st segment reddish yellow.
Black; base of antennæ, part of thorax, 1st segment entirely, sides of 2nd, and legs, reddish yellow. - 47. *secretus*, 1 $\frac{1}{4}$ line.
- §§§ The 1st three segments entirely yellow.
Reddish yellow; sides of thorax and abdomen from the 4th segment black. - - - - - 48. *dysalotus*, 1 $\frac{1}{4}$ line.

Thirty-five species of this genus are included as British in Marshall's 'Catalogus' (1870), but this number is increased to forty-eight in the 1872 catalogue. *P. nigrinus*, Foerst., *P. distinctus*, Foerst., *P. intermedius*, Foerst., *P. incertus*, Foerst.,

P. mülleri, Foerst., *P. juvenilis*, Foerst., *P. micrurus*, Foerst., *P. procursorius*, Foerst., *P. xylochophilus*, Foerst., *P. analis*, Foerst., *P. geochares*, Foerst., *P. brevis*, Bridgm., and *P. hieracii*, Bridgm., have since been added (see Trans. Ent. Soc. Lond., 1881, pp. 155-7; 1882, pp. 147-8; 1883, pp. 161-4). Thirteen species are figured on plates 12 and 37 of Vollenhoven's 'Pinacographia.' The interesting economy of the *Pezomachi* having been lately noticed in these pages (Entom. xvi. 49), it does not seem necessary to again refer to it; and a list of species, with their hosts, can but be to a great extent inaccurate, owing to the erroneous determinations and doubtful synonymy of the older authors. *Pezomachi* have been bred from various Lepidoptera, especially *Psychidæ* and other case-bearers, from a few Coleoptera and Tenthredinidæ, from *Microgaster* cocoons and the egg-bags of spiders; and several species (*P. vulpinus*, *P. pumilus*, &c.) appear to be connected with various ants, which they so much resemble.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTE ON THE SEASON.—I can fully corroborate the various complaints of the scarcity of insect life during the past summer. Many of the most common species of all orders have been almost entirely invisible in this neighbourhood. The aculeate Hymenoptera seem to get less and less every year, and even the Ichneumonidæ have this season yielded very little worth recording.—EDWARD CAPRON, M.D.; Shere, Surrey.

INSECTS IN THE VALLEY OF THE WYE.—Having been much interested in reading the notes on insects from various parts of the country which have frequently appeared in the 'Entomologist,' I have thought that others may like to see a short account of insects observed by me in the Valley of the Wye, although I have not obtained any rarities. For several years I have spent part of the month of July near the village of St. Briavels, in the extreme western part of the county of Gloucestershire. The species mentioned were observed on the banks of the Wye, from Bigsweir to Brockweir, and between the latter village and St. Briavels. This part of the country is extremely beautiful and abounds in hills and woods, and the vegetation is most luxuriant and varied. There was however an unusual scarcity of insects in

this part of the country, as there seems to have been in most other parts, this season; and the reason suggested in the 'Entomologist' for September, that it is owing to the number of collectors, cannot apply to this locality, as I have not heard of nor met with any. With regard to butterflies, *Argynnis paphia* was much less plentiful than usual. *A. aglaia* and *A. adippe* I did not see, although in former years they have occurred, but never plentifully. The local and handsome *Vanessa c-album* was very scarce this year. During some seasons I have found it generally distributed about this neighbourhood, and have frequently watched them ascend above the tops of high trees and then descend to near the ground; and I have taken two together while thus sporting. This insect occurs both in woods and lanes, and varies considerably in shade, both of upper and under side. I saw *Apatura iris* here on a former occasion, but have not seen it this year. The other butterflies I have met with this season have been species of general distribution. I may mention finding here, in 1877, a male *Satyrus janira* in copulation with a female *S. hyperanthus*, but did not obtain any ova. Moths were very scarce, with the exception of a few species. *Eubolia mensuraria* may be mentioned as one of the most plentiful. The following species have been taken here in July in former years, but they were all either very scarce or quite absent this year, viz., *Macroglossa stellatarum*, *Sesia myopæformis*, *Nudaria mundana*, *Uropteryx sambucata*, *Crocallis elinguaris*, *Cleora lichenaria*, *Geometra papilionaria*, *Timandra amatoria*. The last-named species I have always found at rest on hedge-banks, and it seems to take no pains to conceal itself from view, as many others do. Among the moths of the locality which I did not see were *Minoa euphorbiata*, *Abraxas ulmata*, *Eupithecia pulchellata*, *Cidaria picata*, *C. prunata*, *Notodonta camelina*, *Acronycta rumicis*, *Leucania conigera*, and many of the commonest Noctuæ, Pyrales and Crambites. In the pathway of a field there were hundreds of small holes inhabited by two species of bees; and I noticed a very curious insect, which when flying appeared as though enveloped in a mist. It turned out to be a gnat with remarkably long legs in proportion to its size, even for the Tipulidæ. The name of the insect is *Dolichopeza sylvicola*, and it is figured in Curtis's 'British Entomology.'—WM. PASKELL; 39, Hawkstone Road, Rotherhithe, S.E., September 15, 1883.

COLLECTING IN THE NEW FOREST.—At the end of July I returned from a week's collecting in the New Forest. It may perhaps be interesting to readers of the 'Entomologist,' who may have contemplated a visit to this favourite ground, to know what I did there. The result of my visit was most unsatisfactory; in fact, I doubt whether any week could be found during the whole season which would have produced such poor success. It is the more remarkable, as during the six weeks immediately preceding the time of my visit, I had found a very fair average of insects in all the districts I had worked, one or two species having appeared in greater numbers than usual. But at the end of the second week in July a cold north-west wind set in, which continued, with but slight variation, until the end of July. This, combined with the wet weather experienced from the 14th to the 23rd, must account principally for the non-appearance of Lepidoptera. On the other hand, larvæ and pupæ ought to have been as plentiful as usual; but though the beating-tray was in requisition for three or four days, nothing save one *Notodonta chaonia* fell under the stick; and though tree trunks were searched again and again for pupæ of *Lithosia quadra* and *Liparis monacha*, not one was to be seen. I am therefore somewhat at a loss to account for this disappearance of insect life. It was suggested by a resident in the Forest that the scarcity of imagines was owing to the prevalence of ichneumons, but in my own experience I did not observe more than the average number of these insects. Had they been more plentiful than usual, I doubt whether their increase ought to have interfered to such a great extent with the finding of larvæ. Moreover, I believe it to be the experience of most entomologists that the balance of nature is pretty evenly kept up between Lepidoptera and Ichneumonidæ, and that the one does not increase very greatly without a corresponding increase of the other. The total number of species seen by me was twenty-six. Of these, the only insects which might be called plentiful were *Satyrus janira*, *S. hyperanthus*, and *Lycæna ægon*. At sugar the total number of specimens seen were three *Leucania turca* and three *Mania maura*. This for three evenings' work! The result of one evening's sugaring near Salisbury was three *Cymatophora duplaris* and one *Triphæna pronuba*. The only Geometer which appeared in any numbers—and that really very sparsely—was *Ypsipetes impluviata*. There was one peculiarity with regard to

the time of appearance of several species. *Limenitis sibylla* was out at the end of June, whereas *L. quadra* and *L. monacha* had not put in an appearance at all at the time I left, viz., July 23rd. —J. E. TARBAT; Hammersmith, W., August 30, 1883.

NOTES ON PAST AND PRESENT.—The following notes will perhaps interest some of your readers. About the year 1876 (I cannot remember the exact date) I noticed a number of specimens of *Acontia luctuosa* at Beckenham, Kent; they were flying in the sunshine. I have often visited the locality since, but have not seen any more. In 1878 I got one specimen of *Eremobia ochroleuca* at light at Margate. In 1879 I went to Madeira for five months. The following are a few of the insects noticed there:—*Colias edusa*, *Vanessa cardui*, *Lycæna bætica*, *Deiopeia pulchella*, *Macroglossa stellatarum*, *Deilephila euphorbiæ* (the larvæ were very common), *Sphinx convolvuli*, *Leucania* (? *extranea*), *Plusia* (3 species), *Pterophorus* (1 species), &c. When returning I noticed *Plusia gamma*, *Vanessa cardui*, &c., in the St. George's Channel, many miles from land. The same year I caught a fine specimen of *Calosoma sycophanta* at Margate. This year I have taken, during the past few weeks, the following species at light at Chislehurst:—*Halias quercana* (one specimen July 29), *Pseudopterpnæ cytisaria*, *Scotosia dubitata*, *Noctua triangulum*, *Plusia chrysitis*, *Gyrinus natator* (it seems strange that a water-beetle should come to light, but so it was), *Platypteryx hamula* (4 specimens), *Eubolia mensuraria*, and multitudes of common species, such as *H. nictitans*, and var. *erythrostigma*, *L. auriflua*, *B. rhomboidaria*, *Crambus* (5 species), &c. The day before yesterday I caught a specimen of *L. argiolus* near Hayes. —T. D. A. COCKERELL; Glen Druid, Chislehurst, Aug. 15, 1883.

COLIAS EDUSA IN NOTTINGHAMSHIRE.—I have the pleasure to record the capture of a fine male *Colias edusa* on the 17th of this month. The specimen was evidently just fresh from the chrysalis. I may add that it is six years ago since it appeared in this neighbourhood, when we captured it in profusion.—Mrs. ALDERSON; Park House, Worksop, Notts, September 19, 1883.

COLIAS EDUSA IN GLOUCESTERSHIRE.—Having seen no notices of the occurrence of *Colias edusa* this season, I should like to record that I met with it on Saturday last, the 15th inst., flying over clover, on one of our hills; the weather was gloriously fine,

but insects by no means plentiful,—V. R. PERKINS; Wotton-under-Edge, September 18, 1883.

VARIETIES OF *SATYRUS TITHONUS*, &c.—I recently captured two varieties of *Satyrus tithonus*, both males. One specimen has two additional small black spots on all four wings, just inside the hind-marginal band; in the other, all that portion of the left fore wing outside the transverse brown band is bleached, the rest of the insect being quite normal. On August 16th, in Hampshire, a specimen of *Pachynemias hippocastanaria* fell to my net at dusk; last year I took the same species as early as March 18th, at Shirley. *Eubolia lineolata* seems to have the repute of being specially a coast insect. I netted several specimens in August, on the chalk downs at Warminster, in Wiltshire, a long way inland.—F. J. BUCKELL; 316, Upper Street, Islington, Sept. 17, 1883.

DEILEPHILA LIVORNICA IN SURREY.—I see that several captures of the above-named species have recently been recorded in the 'Entomologist.' Another can be added to them, as a friend of mine took a specimen in good condition last June, near Box Hill, at rest on a bramble bush.—WM. PASKELL; 39, Hawkstone Road, Rotherhithe, September 15th, 1883.

RETARDED EMERGENCE OF *SPHINX LIGUSTRI*.—Referring to a note on this subject in Entom., vol. xvi., p. 187, I may mention that in July of the present year I had two specimens of *S. ligustri* emerge in my breeding-cage, the larvæ of which pupated in September, 1880. It will therefore be seen that their emergence was delayed two years beyond the normal time. The bulk of the brood emerged in due course in 1881; none, so far as I can remember, in 1882. The pupæ were kept in an outhouse.—WM. J. ARGENT; Wanstead, September, 1883.

NOTE UPON DURATION OF PUPAL STAGE OF *SMERINTHUS POPULI*.—My son found a full-fed larva of the above-named species on the 14th July last. It pupated in a pill-box in which it was placed on the 19th of the same month, and emerged a perfect specimen on the 17th of August.—H. JOBSON; 3, Clarendon Road, Walthamstow.

SPHINX CONVULVULI AT NOTTINGHAM.—A very fine specimen of *Sphinx convolvuli* has just been taken in a garden here. The

insect is now in my possession.—W. T. WRIGHT; 40, Long Hedge Lane, Nottingham, September 5, 1883.

SPHINX CONVULVULI IN HERTFORDSHIRE.—A fine female of this insect was brought to me on 15th September; it was taken at rest on a door-plate. *S. convolvuli* occurs here and at Baldock nearly every year.—JNO. HARTLEY-DURRANT; Bancroft House, Hitchin, Herts, September 15, 1883.

SPHINX CONVULVULI IN HAMPSHIRE, &c.—On Sept. 12th a bricklayer engaged on a building in this town (Bournemouth), brought to me a live specimen of what he termed “an owl,” but which was in reality a fine specimen of *Sphinx convolvuli*. Unfortunately, having carried it fluttering in his hand, the anterior right wings got somewhat rubbed, which impairs its value as a cabinet specimen; but the fact of its occurrence is interesting, especially during this season of dearth of Lepidoptera. Perhaps I ought to mention that I noted one exception to the general scarcity of insects here this season in the case of lace wings (*Hemerobius*). These elegant creatures, with their bright green bodies, golden eyes, and iridescent and beautifully reticulated wings, literally swarmed during August. One evening I counted thirty-three specimens on one gas lamp, besides numbers flying around. It would be interesting to know whether this abundance of *Hemerobius* has been observed elsewhere, and, if so, whether its occurrence has been marked by any diminution or absence of Aphides on rose trees, &c. I believe the larva of this insect is termed the “Aphis-lion,” for no sooner do they get on the plants than they attack the Aphides with insatiable voracity, and are thus of incalculable benefit to the horticulturist.—W. McRAE.

SPHINX CONVULVULI IN ABERDEEN.—A very fine specimen of this beautiful species was taken at rest in my garden, by a little boy who brought it to me alive, on the 28th August.—JOHN MUNDIL; 22, Watson Street, Aberdeen, September 22, 1883.

ACHERONTIA ATROPOS NEAR EDINBURGH.—A specimen of *Acherontia atropos* was taken here in a grocer's shop, on September 14th. The moth is a very fine one, measuring $5\frac{1}{2}$ inches from tip to tip of the wings, the marks on the thorax being also very distinct.—A. E. J. CARTER; Joppa, N.B., Sept. 18, 1883.

NOTE ON THE OCCURRENCE OF *HEPIALUS VELLEDA*.—While staying at Okehampton, in Devon, last June, I took on the moors near there several fine specimens of the above insect. I have also taken it in two localities in Surrey, and have seen specimens from Sussex; thus it can no longer be regarded as a purely northern insect.—J. EVERSHED, jun.; Kenley, Surrey, Sept. 21.

VARIETY OF *CIRRHCEDIA XERAMPELINA*.—I have recently had the pleasure of adding to my collection a remarkable dark variety of *C. xerampelina*, which I found, on the 25th of August, at rest on an ash, evidently from its fine condition quite recently emerged from the pupa, probably not more than an hour or two before I had the satisfaction of transferring it to one of my chip boxes. The colour of the front wing is ferruginous-purple, faintly tinged with orange-yellow on the costal margin near the tips. The median band is not excavated on the inner border, and is shown distinctly by a thread-like orange line on each border, which extends from the costa to the inner margin. The hind wing is slightly darker, more rosy than in normal specimens.—T. MELDRUM; 13, Skellgarths, Ripon, September 21, 1883.

[This variety occurs regularly in the Isle of Man, and has been taken by Mr. Prest at York.—J. T. C.]

THE DISTRIBUTION OF *ABRAXAS ULMATA*.—It may interest Mr. J. H. Jenner (Entom. xvi. 211) to know that this species is by no means confined to the midland counties. I have seen specimens taken on the Addington Hills, near Croydon, and it occurs in the garden of my friend, Mr. A. R. Wallace, at Godalming, in Surrey. To my knowledge it is taken also in the neighbourhood of Horsham, in Sussex. References to entomological literature would no doubt add many other localities in the south of England. From the western counties I have received it from near Newnham, in Gloucestershire. Its occurrence in Epping Forest and at St. Osyth, in Essex, is recorded in the 'Transactions of the Essex Field Club' (vol. ii. p. lviii.)—R. MELDOLA; September 3, 1883.

LEPIDOPTERA OF UNST.—Mr. McArthur has recently returned from this, the most northern of the Shetland Islands, with an exceedingly fine lot of Lepidoptera. Although he considers the past to have been a bad season, his captures are of a very interesting character, and appear to be a typical series of the

fauna of the Island. The most remarkable moth is possibly new to science, being a large *Crymodes*, some specimens of which are nearly as large as *Petasia nubeculosa*. It is evidently a most variable species, but will probably turn out to be an extreme form of *Crymodes exulis*. As it is intended to fully describe this collection in a future number of the 'Entomologist,' this notice will suffice for the present.—JOHN T. CARRINGTON; Sept., 1883.

NOTES FROM SURREY.—I was staying during the whole of May and June in the western part of Surrey, in the neighbourhood of Camberley. I collected for the most part by day, as insects were so scarce on the wing in the evening as to make it scarcely worth while to seek for them. I found sugaring so entirely unproductive after several attempts, on what are considered favourable evenings, that I abandoned it. During daylight the prospect was not so bad, for *Argynnis selene* was to be seen in fair numbers, as was *Satyrus megæra* and the other members of the latter family, due at that time. Among the Blues *Lycæna alexis* was to be seen, and later on *L. ægon*. The usual members of the *Pieridæ* were visible, and *Anthocharis cardamines* was in more than usual numbers. Among the Sphingidæ I noticed *Smerinthus tiliæ*, *Chærocampa porcellus*, and *C. elpenor*; and among the Zygænidæ, *Zygæna loniceræ*, *Z. trifolii*, and *Z. filipendulæ*. The usual members of the Hepialidæ were out, *Hepialus lupulinus* in larger numbers than usual. I also took *Lithosia mesomella* and *Euthemonia russula*, and *Bombyx rubi* was as plentiful as usual. I observed a considerable number of the common Geometræ, the species most worthy of note being *Geometra papilionaria*, *Hemithea thymiararia*, *Ephyra pendularia*, *Hyria auroraria*, and *Eubolia palumbaria*. I also noticed *Platypteryx lacertula* and *P. falcula*. On the walls I found, as usual, *Bryophila perla*. I also saw a considerable number of species belonging to the Noctuæ, but none in any remarkable abundance. Most of the species taken by me were of the normal type, the only noteworthy variety being a hermaphrodite *Fidonia atomaria* with the wings of the female and with male antennæ. I also noticed some more than usually strongly marked varieties of *F. atomaria* and *Thera variata*, but my series of these two species went through almost every shade of colouring. The larva of *Clostera reclusa* was common on some small aspens, but

other larvæ were scarce with the exception of *Ypsipetes ruberata*.—E. Y. WATSON; The Ferns, Tivoli, Cheltenham, Aug. 30, 1883.

ADDITIONAL NOTES FROM CHICHESTER.—On the 19th of July I took a beautiful specimen of *Sesia bembeciformis* (*crabroniformis*) in a ditch here. It had evidently only just emerged from the pupa, which I found a few yards from the spot where the moth was flying. It was placed among the roots of *Polypodium vulgare*, growing on Sallows (*Salix caprea*). My visitors to light have been *Selenia illunaria*, *Cidaria prunaria*, *Cilix spinula*, *Calligenia miniata*, *Pyralis fimbrialis*, *P. glaucinalis*, *Noctua rubi*, &c. A fine specimen of *Sphinx convolvuli* was captured in a shop in the town, and brought to me on Sept. 14th, and a larva of *Acherontia atropos* on the 17th, found in a garden. A single specimen of *Colias edusa* was seen flying in the garden, and *Cynthia cardui* has been somewhat abundant.—JOSEPH ANDERSON, jun.; Alie Villa, Chichester, Sussex.

SCARCITY OF LEPIDOPTERA IN QUEENSLAND.—Noticing some remarks in the 'Entomologist' (Entom. xvi. 238) on the causes of scarcity of Lepidoptera in England last season, it may be interesting to some of your readers to know that we have suffered a similar scarcity in this part of Queensland, viz., some eighty miles from Rockhampton. It appears to have been the same also in other parts, for a friend, writing from Brisbane, 400 miles further south, complains that he has not taken a single specimen of Lepidoptera this season. In the fall of the year 1882, viz., February, March, and April, our best collecting months, Lepidoptera were unusually abundant: *Pieris teutonia* and *Catopsilia pomona* literally swarmed for a time, and for a few days they fell like snow in the streets of Rockhampton; *Diadema bolina* was nearly as numerous. The larvæ of the latter swarmed on their food-plant, *Sidera retusa*. Other species were also plentiful. A mild open winter followed (we have, at times, as much as 6 to 10 degrees of frost). Our dry season, from August to November, was very wet, very few species of Lepidoptera appearing. Coleoptera were very plentiful for a short time in December and January; but after that insect-life was very scarce. The months following, which should have been wet, were very dry, herbage and water were equally scant, and only an occasional butterfly was to be seen. The only Rhopalocera, which seemed to have escaped

the general *non est*, was *Acræa andromache*, this species being more numerous than ever, and forming a pleasing contrast to the otherwise quiet monotony. In April, 1882, larvæ of various kinds were swarming on the bushes. I took, amongst others, some four dozen of a very handsome caterpillar, nearly full-fed. These changed under ground, and from them I obtained only one imago, which proved to be a new small *Sphinx*. I examined them again late in the season, and found that, although most of the pupæ were dead, several were still alive and healthy. The reason why the pupæ remained so long in that state it is difficult to say, unless it was caused by the irregularity of the season. Very few were ichneumonised, although in the fall of the season, 1882, I noticed that specimens of the Ichneumonidæ were particularly numerous; but that would be hardly sufficient to account for the utter dearth of Lepidoptera that has prevailed for the last six months.—GEORGE BARNARD; Coomooboolaroo, Duaringa, Rockhampton, Queensland, June 1, 1883.

NATURAL SUGARING.—Mr. C. V. Riley, in the 'American Naturalist,' says:—"Lepidopterists have long found sugaring—*i. e.*, the besmearing of the tree trunks with various, more or less intoxicating, sweets—one of the best means of obtaining night-flying moths, but we do not recollect of seeing any record of what may be called natural sugaring. The year 1882 has been remarkable for the excessive abundance of a yet undescribed species of *Lachnus*, which we have called *Lachnus platanicola*, infesting the sycamore. We have received accounts of its excessive abundance from widely different sections of the country, as far north as Michigan, and as far south-west as Missouri; while on trees in the grounds of the Department of Agriculture, it has prevailed to such an extent that whole trees, including leaves, branches, and trunks, were heavily blackened by the growth of the fungus (*Fumago salicina*), which developed on the saccharine exudations from the *Lachnus*. Hosts of sweet-loving insects, including all sorts of Hymenoptera during the day and chiefly Lepidoptera at night, were attracted to the trees, which even excelled those artificially sugared as collecting-ground for various Noctuids. The brilliant and glistening eyes of these moths, thickly settled upon all parts of the trees, gave these at night the appearance of being studded with gems, and produced an effect rarely witnessed, we imagine, by entomologists."

KILLING LEPIDOPTERA.—Having often thought that there is room for improvement in the killing of Lepidoptera, I this season made use of, as I think, a new method, which I have found effective for the above purpose. Having procured a bottle with a wooden cap, which answers better than an ordinary cork, I then cut up small pieces of india-rubber and soaked them in chloroform, which I found was largely absorbed by it. These pieces, after having been left in solution a day, were taken out and transferred to a dry corked bottle, and when exposed to the air they give off vapour and gradually shrink to their original size.—A. B. NORTHCOTE; Leven Terrace, Edinburgh, September 11.

HYPERACMUS CRASSICORNIS, Grav.—Last year I recorded the occurrence of the female of this insect, but neither Holmgren or Gravenhorst appear to have been acquainted with the male of it. On the 3rd of this month, while sweeping some rough grass under trees, I had the good fortune to capture a fine pair, male and female, and can now describe the sexual distinctions. The male taken is somewhat larger than the female, and in colour and general appearance is like it, but the antennæ differ in a very remarkable manner. In length they are as long as the whole insect, and are as thick as in the female, but the joints of the flagellum, instead of being transverse as in the latter, are all longer than broad. The first four are subequal and about three times as long as broad; the fifth is one-third shorter than the fourth, and they then gradually decrease in size until the penultimate, which is about one-third shorter than the apical. At the apex of the fourth and the base of the fifth is a small smooth excavation, the two together forming a distinct notch, very similar to the antennæ of the males of the genus *Lampronota*, but the thick legs, protuberant face, and shortness of the aculeus in the female refer it to the *Exochi* group of the Tryphons. Holmgren's definition will, however, now require alteration, as he separated the genus from *Exochus*, on account of the first joint of the flagellum being transverse in the female, not being aware that in the other sex such was not the case. The notch in the male antennæ is a much better characteristic.—EDWARD CAPRON, M.D.; Shere, near Guildford, September 3, 1883.

[Brischke describes the male of this species, especially referring to the structure of the antennæ, in 'Schrift. d. naturf. Gesell. in Danzig,' n. s., vol. iv., part. iii., p. 108 (1878).—E. A. F.]

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NOTES FROM GIBRALTAR.

BY CAPTAIN E. F. BECHER, R.A.

I WAS staying at Gibraltar from the end of August, 1881, until July, 1882, and the following short account of the Lepidoptera observed there during my visit may not prove uninteresting to some entomologists.

I did not turn my attention much to the Heterocera, but I think that I worked the Rhopalocera fairly during my stay, and among the first species that I observed was *Papilio machaon*, which I took on the Rock on the 30th of September; and it again made its appearance during the second week of March the next year. One of the earliest butterflies to appear on the Rock is *T. rumina*, which usually makes its appearance about the beginning of March; it varies very considerably in numbers, its abundance or scarcity depending much upon the season, but it is usually fairly plentiful. The spring previous to my stay was a very wet one, and this insect was not observed at all: one of its favourite haunts is just above the Alameda Gardens, where I had no difficulty in procuring it. Among the Pieridæ I noticed *Pieris rapæ*, *P. napi*, and *P. brassicæ*, but I have no note beyond their mere occurrence. *Euchloe belemia* is fairly common on the Rock, as is also *E. euphenoides*, the latter of which appears about the commencement of March, and is especially common in the Cork Woods; the first time I noted the appearance of the females was the 10th of April. I also came across an occasional *E. cardamines* in the Cork Woods; and I likewise noticed a few *Leucophasia sinapis* in the same locality, but it is not common. I also took one of the variety *diniensis* there; this species and

the two preceding I noted as observed about the beginning of April.

I may here explain, in respect to my reference to the Cork Woods, that they are situated in Spain, about six miles from Gibraltar, and, unless I make special mention of any species occurring on the Rock, it may be understood that I have not noticed it there.

About the second week in March I took *Colias edusa*, but I had also taken it in the Cork Woods the previous September, and that commonly; also the variety *helice*, but I did not find it in any numbers. One of the most beautiful of the Rhopalocera, and also one of the commonest, both on the Rock and in the Cork Woods, is *Gonepteryx cleopatra*, and I noted its appearance during the second week in March; I also took it among the cork trees on the 16th September the previous year. *Vanessa polychloros* does not occur in abundance,—in fact I have never heard of its being observed there. I saw one during my stay, and only one, that being in the Cork Woods on the 16th June. The same remark may almost be made regarding *V. atalanta* and *V. cardui*. One or two of the former are generally to be observed either on the Rock or in the immediate neighbourhood, and I first noticed it upon the Rock about the second week in March, but also in the Cork Woods in September of the previous year. The latter I have found in about the same numbers as *V. atalanta*, but I never succeeded in capturing one on the Rock, as its swift flight, over difficult and dangerous ground, always enabled it to elude me. Among the Satyridæ I have noted *Satyrus megæra* and *S. egeria* as occurring commonly. To the best of my remembrance they are found on the Rock, but unfortunately I did not take special note of their occurrence. Also the variety of *S. janira*, viz., *hispulla*, is common there. *Hipparchia fidia* makes its appearance late; I did not see it upon the Rock before the commencement of June. It is far from common, and I only saw it on the Rock, and not in the neighbourhood. I have a note of the capture of *Epinephele ida* and *E. pasiphæ* on the 5th June, they being species of common occurrence. In my local collection I have a specimen of *Cænonympha dorus*, which was given me by a brother officer, but I have never seen it alive, nor was it observed during my stay. About the commencement of March, in the Cork Woods, *Thecla rubi* may be seen commonly

while its flight lasts, which is not for long; and *T. acaciæ* is fairly numerous in the same locality about the beginning of June. Not easily distinguished on the wing from *T. acaciæ* is *T. ilicis*, but, although I only took one in the Cork Woods on June 14th, I cannot say authoritatively whether it is rare or common. Of common occurrence is *Thestor ballus*, the females appearing about the middle of March, and the males a little later. Commonly met with on the Rock is *Polyommatus phlæas*, and it may be seen about the second week in March; but the variety *eleus* is not so common, and appears later, generally towards the end of the month, the 24th, being the date upon which I first observed it. *Cupido baeticus* is common on the Rock, as is also *C. telicanus*, the latter of which I noted on the 16th June, but I also took it during the previous September in the Woods. *C. icarus* is also plentiful at Gibraltar, and may be observed during the second week in March. I have no notice of the appearance of *C. argiolus* on the Rock, but I fancy that I can remember its occurrence there, although it is fairly numerous in Spain, but, on account of its predilection for bramble, it is not so easy of capture. *C. medon* is common on the Rock. *Hesperia proto*, *Erynnis alceæ*, and another that I have not identified, I took, but am not certain of the exact locality. In the Cork Woods *Thymelicus thaumas* and *T. actæon* are numerous. *Pamphila nostrodamus* I took in September in the woods, and again on the 5th June. I visited Tangier occasionally during my stay, but I was not very successful, the great drought no doubt being one of the causes. My list of captures there reached a total only of twenty-two species.

The year of my stay was unfavourable for Lepidoptera, it being a more than ordinarily dry season, the previous spring having been very wet; otherwise my list of captures would probably have been more extensive.

September 10, 1883.

TORTRICES AND TINEINA BRED AND CAPTURED IN 1883.

BY GEORGE ELISHA.

ONE is often deterred from publishing one's own practical experiences from fear of hearing it said that all that is already known; but the following few notes and list of localities may be

useful to beginners, if not to the older hands. My little contribution, however, is written for those who are not in that happily advanced state, with a desire to help them forward in a study that has afforded me many years of genuine pleasure, and perhaps save them many a useless journey, which means, in the height of the season, considerable loss of valuable time. I have experienced many such disappointments from the want of a helping hand, and often, from fear of a refusal, have hesitated to ask those who perhaps would have given the information cheerfully and with the greatest pleasure. As there are always some in that other unenviable state of mind, the practice that has obtained of late of entomologists publishing their experiences is much to be commended, if only to assist the inexperienced. Even the old hand must admit that with all his knowledge there is still a deal to learn about habits and localities of various species, and occasionally he gets a hint perhaps from the published experiences of a beginner that is extremely useful to him, for with all his perseverance and industry the ground that can be properly worked by any entomologist during an entire season is very limited.

In the beginning of the month of April, by forcing, as described by me in a former volume of the 'Entomologist,' I bred numbers of the *Lithocolletidæ* from larvæ collected during the autumn and winter months, among them *Lithocolletis lautella*, *L. cavella*, and many others from "Darn"; *L. tenella* and *Scardia carpinetella* from the hornbeams in that part of Epping Forest situated opposite the waterworks at Walthamstow. During April I bred a fine long series of *Coccyx splendidulana* and a few *Heusimene fimbriana* from oak-galls collected during January. From the salt-marshes at Southend and Canvey Island I obtained, during the autumn and winter months, larvæ of *Coleophora salinella* on *Atriplex portulacoides* and *Suaeda maritima*; *C. tengstroemella* on *Chenopodium*, *C. artemisiella* on *Artemisia maritima*, *Semasia rufillana* in seed-heads of *Daucus carota*, and *Cochylis francillana* and *Argyrolepis zephyrana* in the stems; in heads of teasel the larvæ of *Eupæcilia roseana* and *Penthina gentianana* were common; I also found larvæ of *C. dilucidana* in stems of wild parsnip, *Gelechia atriplicella* and *G. obsoletella* on *Atriplex* and *Chenopodium*, and *Gymnancycla canella* on *Salsola kali*; the cases of *C. argentulella* were plentiful on seed-heads of yarrow, and the larva of *Dicrorampha*

petiverana in the roots, all of which in due season produced fine imagines. I also found a few larvæ of *C. therinella*, but failed to rear them, being, I think, one of the most difficult species to breed. During a visit to the same locality in May I procured fine imagines of *Stigmonota composana* among clover, and *D. sequana*, *D. plumbagana*, and *D. saturnana* were common on the railway banks; and on a fine plant of *Conium maculatum* I found larvæ of *D. alstrœmeriella*, which produced a fine series in July. I also obtained, during the winter, larvæ of *Ephippiphora fœneana* and *D. simpliciana* in the roots of *Artemisia vulgaris* from the lanes about Sutton, and larvæ of *C. murinipennella* on seeds of *Luzula pilosa* at West Heath, Hampstead. In Headly Lane I obtained larvæ of *G. bifractella* in heads of *Inula conyza*, and bred a fine series of *G. subocellella* by collecting the seed-heads of wild marjoram in November, and keeping them exposed to the weather during the winter; also the larvæ of *Gracilaria auroguttella* in cones on *Hypericum*, *G. semifasciella* on maple; and larvæ of *Pædisca bilunana* in birch catkins were common in their season at the same place.

During a short visit to Dover in April I found larvæ of *Psychoides verhuellella* under the fronds of ferns in the lanes near Alkham; and at St. Margaret's Bay the larvæ of *Stigmonota leplastriana* in stems of wild cabbage, *Pterophorus microdactylus* in old dried stems of *Marrubium*, and *Douglasia ocnestomella* were plentiful in dried stems of *Echium*.

On the Castle Hill at Scarborough, in June, I found the larva of *G. tringipennella* in abundance in leaves of *Plantago lanceolata*, and observed the larva of *C. alcyonipennella* swarming on every plant of *Centaurea nigra*, besides many commoner species.

At Wanstead I found the larvæ of *C. hemerobiella* on white-thorn, *C. gryphypennella* on rose, *C. genistæcolella* and *G. albi-palpella* on *Genista anglica*, and *G. mouffetella* in shoots of honeysuckle; also imagines of *S. emortuella*, *Ypsolophus alpella*, *Laverna stephensiella*, *G. luculella*, and many others on oak trunks.

At Sevenoaks (in a field adjoining Bat and Ball Station) I found the larva of *Cosmopteryx drurella* in leaves of wild hop, wherever it was growing, and near the chalk-pit at Kemsing the larva of the very beautiful *Hypercallia christiennella*, in the shoots of *Polygala vulgaris*, occurred, but rather sparingly.

During a fortnight's stay at Deal, during the end of July, I captured fine specimens of *Argyrolepis mussehliana*, *Eupœcilia rupicolana*, *Chauliodus illigerella*, *D. alpinana*, *Grapholita nigromaculana*, *A. badiana*, and numbers of others, to mention which would perhaps occupy too much space.

During last month I found the larvæ of *C. inflatella* tolerably plentiful in the lanes about Croydon, and this month (September) the larva of *G. inopella* in seed-heads of *Inula dysenterica* in the chalk-pit at Northfleet.

From the above few notes regarding some of the species bred this season, it will be seen that there is plenty to be done during the autumn and winter in collecting larvæ of various species, which when bred, sometimes rather freely although scarcely ever seen at large in the perfect state, amply repay for many an unpleasant journey during the dreary winter months.

122, Shepherdess Walk, City Road, Sept. 16, 1883.

A MONTH AT MORTHOE, NORTH DEVON.

By W. S. RIDING, B.A., M.D.

THE wooded combes of North-East Devon begin to be missed at Morthoe. A few ash, a few weather-beaten elms and sycamores, are all the trees of any size within a circuit of two miles. The "bare-worn ribs and joints of old starved mother earth," so graphically described by Kingsley, are covered with rough pasturage, a few cultivated fields, and moorland where heather luxuriates. The sand-hills at Woollacombe, about a mile to the south, bound together by maram grass, are the home of sea-spurge, great mullein, foxglove, and hound's-tongue; and further inland the irregular ground is filled with vegetation,—stunted privet, elder, honeysuckle, gorse, bracken, Scotch and English heather, teasel, ragwort, bugloss, willow-herb, hemp-agrimony, loose-strife, and numberless small plants.

The following notes on Lepidoptera, observed at Morthoe and the adjoining districts, refer, in point of time, to the interval between the middle of August and September 16th of the present year.

The common Diurni were all fairly represented. *Vanessa*

cardui, *V. io*, *V. atalanta*, and *Lycæna agestis* (second brood) were in abundance. A few worn *Argynnis paphia* put in an appearance occasionally. Worn imagines of *Thecla quercus* were flying about some plantations of young oak towards Braunton, and *Gonepteryx rhamni* along the hedges in the same direction. *Macroglossa stellatarum* hovered over *Centranthus ruber* on sunny days. The second brood of *Aspilates citraria* was easily disturbed in large numbers in several places; almost all the insects were males. No plants of *Daucus carota* were to be found, but bird's-foot trefoil was growing freely. Other Geometers met with were *Epione apiciaria*, *Metrocampa margaritata*, *Asthena sylvata* (worn), *Gnophos obscurata*, *Ypsipetes elutata* (several varieties), *Larentia didymata*, *L. pectinitaria*, *Melanippe rivata*, *Coremia ferrugata*, *Cidaria silaceata*, *C. russata*, *C. testata*, *Scotosia dubitata*, and *Anaitis plagiata*. The *G. obscurata* were in good condition, and much larger, darker, and with more confused markings than those taken on the chalk in the Isle of Wight. *S. dubitata* had just emerged, and retained its rosy gloss; sallow must have been the food-plant of the larva, as no buckthorn was to be seen. *Zygæna filipendulæ* was flying in the sunshine, and the empty cocoons were in countless numbers on the stems of various grasses. There are very few beech-hedges in this part of Devonshire, but from these many larvæ of *Demas coryli* were beaten. Larvæ of *Euchelia jacobæ* were feeding in great numbers on the ragwort, completely stripping the plants. Larvæ of *Bombyx rubi* and *Agrotis porphyrea* were taken on the heather, and those of *Acronycta psi* were common on various shrubs. Larvæ of *Eupithecia pulchellata* were still to be found on the flowers of *Digitalis purpurea*, but the majority had evidently gone to earth. The same may be said of those of *E. linariata* on *Linaria vulgaris*. By shaking plants of *Senecio jacobæ*, *Achillea millefolium*, *Eupatorium cannabinum*, and *Artemisia vulgaris*, larvæ of *E. castigata*, *E. centaureata*, *E. absynthiata*, *E. pumilata* could be easily obtained; and in a similar way larvæ of *E. isogrammata* and *E. coronata* were taken from *Clematis vitalba*. Larvæ of *E. subnotata* were found on *Beta maritima* at Braunton. The larva of *Dicranura furcula* was taken near Ilfracombe. The faces of the cliffs on the coast are covered with patches of *Silene maritima* and *Crithmum maritimum*. By searching the former large numbers of larvæ of *Dianthæcia cucubali* were obtained,

feeding when young on the flower-buds and unripe capsules, and when nearly full-grown on the leaves; they for the most part changed into pupæ early in September. Larvæ of *D. conspersa* and *D. capsincola* were taken on the same plant. All these were also found, together with a few *D. carpophaga*, feeding on the capsules of *Lychnis vespertina*, *L. diurna*, and *Silene inflata*, but the great majority on these plants consisted of those of *D. capsincola*, with a good many of *Emmelesia affinitata* and *E. decolorata*. Imagines of *Bryophila perla* and *B. glandifera* were found, the former in large numbers, on old walls.

During the latter part of August sugar seemed a failure; only a few of the commonest insects were attracted. The first week in September was wet and stormy, and prevented evening excursions, but the second week was very favourable, and autumnal species began to emerge freely. I was fortunate enough to take three males and four females of *Polia nigrocincta* in fine condition. This is, I believe, the first time the insect has been taken in England, with the exception of the solitary specimen captured at Padstow in 1862, although imagines and larvæ, the latter especially, have been found pretty freely in the Isle of Man. The specimens I have seen from that locality have a less distinct black band. I was sugaring some hundred and fifty yards from the cliffs on which *Silene maritima* abounded, and at a height of about three hundred feet: *Armeria maritima* was also growing freely around. Other insects that came to sugar were *Epunda lutulenta*, *E. nigra*, *Noctua glareosa* (in large numbers), *N. brunnea*, all sorts of varieties of *Luperina testacea*, from strongly-marked specimens to those in which the lines were barely discernible, *Anchocelis lunosa*, *A. pistacina*, *A. pyramidea*, and *Stilbia anomala*, besides numbers of the commoner Lepidoptera. Two freshly-emerged males of *S. anomala* were taken; one was disturbed from heather during the daytime, and the other was found at rest on gorse at night. On the thorns of this shrub I took many insects, especially when the wind was high, as they appeared stupefied, and were easily boxed. Several females of *S. anomala* were also secured by beating the heather, —they were for the most part a little worn; from two I obtained a fair supply of eggs. Amongst the Pyralides noticed were *Herbula cespitalis*, *Pyrausta purpuralis*, *Scopula lutealis* (abundant in lanes), *S. prunalis*, *Scoparia cembralis*, *S. ambigualis*, *S. resinalis*, *S.*

muralis. The common Crambites were plentiful. *Peronea schalleriana*, *P. tristana*, *P. hastiana* and *P. comparana* were beaten out of hedges: *Sericoris littoralis* was flying about the sea-thrift on the cliffs towards evening. *Xanthosetia zoegana* and *X. hamana* were met with in different localities. *Depressaria alstrœmeriella* was amongst the commoner *Depressariæ* beaten out of thatch. *D. umbellella*, *D. heraciella*, and *D. subpropinquella* came to sugar, and another *Depressaria* (very similar to the last named, but having a black thorax) which I have not yet been able to identify. Larvæ of *Anesychia decemguttella* were taken at Braunton Burrows on *Lithospermum officinale*. Pterophori seemed very scarce; the only ones noticed were *Pterophorus bipunctidactylus*, *P. pterodactylus*, and *P. lithodactylus*.

25, Endsleigh Gardens, N. W., Oct. 17, 1883.

NOTES FROM WOTTON-UNDER-EDGE.

BY V. R. PERKINS.

THE season of 1883 in this locality has been anything but a brilliant one for the entomologist, although it opened well, and for a short period gave promise that it would continue so. All that I can now say is, that taking it all in all, it is somewhat better than last year, and this is certainly the greatest amount of praise I can bestow. Some insects no doubt have been met with in average numbers; some few, and that a very few, have been abundant; but, taking a general survey, they have become far less numerous than during what is designated an ordinary season. Many insects which are generally considered of common occurrence have been in very limited numbers about here, and a few might be said to be rare, so very few having been noticed that they really were conspicuous by their absence; and this was notably the case with some of the butterflies. Nevertheless some good and really scarce things have turned up, as is usually the case in what is said to be a "bad" season, and we have had quality here and there where numbers were wanting.

But besides an inclement season, there are sometimes other causes which tend to reduce the numbers of insects in particular districts; for instance, in a hilly country, as this is, I know that wholesale destruction must take place at intervals, which in the

case of Lepidoptera is more noticeable than in other branches of Entomology.

There are many species which are met with on the slopes of the hills, and some of them are generally to be seen in the greatest profusion; and others occur abundantly, although perhaps not so conspicuous in appearance or habit. Most of these, without doubt, have been both last year and this anything but common, and, knowing what takes place, we at once jump to the conclusion that it is perfectly natural that the butterflies should become scarcer and disappear; for how can it be otherwise when we see all these sloping hill-sides, which during the summer and autumn are covered with long coarse rough herbage which forms admirable feeding-ground for many larvæ, but which is untouched by sheep and cattle? As the winter comes on this dries up, and then on some fine night is found all ablaze. The boys, either out of sheer wantonness, or sometimes by accident, set it on fire, and should the wind happen to be at all brisk, the fire travels, and acre after acre gets scorched or burnt; and just as there happens to be more or less herbage so the ground gets more or less burnt, and is left all bare and blackened till the spring rains come. This must of necessity destroy a great quantity of insect-life, and how any escape at all seems a mystery. But still it remains that, although some species disappear or are very greatly reduced in numbers, others do not seem to be affected by it, but come forth in their ordinary numbers; all the butterflies that occur on these slopes have been most greatly reduced in numbers. Some I have not seen at all, but, on the other hand, *Procris statices* and *Bombyx rubi* have been if anything more abundant than usual, the fires which blazed away over the ground not seeming to have affected them. The Crambidæ have also been abundant, and this is one of the things I cannot quite account for.

Now, if we turn to the woods and downs, there appeared to be, in the spring, a great abundance of small moths, and *Plusia gamma* was as plentiful here as elsewhere; so also was *Syrichthus alveolus*. *Argynnis euphrosyne* was numerous, but *A. selene* altogether absent. *A. paphia* and *A. adippe* I have not seen, but *A. aglaia* made up in numbers for the absence of both. *Vanessa cardui* was common after hybernation, and many have occurred recently. *V. io* was very plentiful, but *Nemeobius lucina* and *Thecla rubi* very scarce; while, strange to say, on August 10th *T. w-album* occurred

plentifully at the blossom of ragwort. In one of the woods we took thirty specimens of the last-named, and could have doubled that number. This Hairstreak we have not met with in this locality before. At this time also we had a great catch of *Charæas graminis*, and also of *Hydræcia nictitans*, both these moths occurring together in the utmost profusion on one of the downs, frequenting principally the flowers of *Scabiosa succisa*.

Among the Hymenoptera I have met with one or two rare things, but I have not done nearly so well in them as I hoped I should. The spring bees came forth early, but their numbers were very limited; and the autumn has been much worse than the spring, very few having appeared. Wasps of four kinds have been far too plentiful both indoors and out; in fact they are everywhere and on everything, proving very troublesome. One day about the middle of last month I was collecting with my nephew in one of the large stone-quarries, where there was a great abundance of various flowers. We noticed the whole ground at the roots of the herbage entirely covered, I may say, with *Vespa vulgaris*. They were crawling about and over everything just like ants, nor did they use their wings when disturbed, or attempt to do so; neither did they take any notice of us, but seemed all intent after something—but what it was we could not make out. The ground over which they were crawling was in size about half an acre, and some few days after this they were as abundant in the same spot as when we saw them. I may add that their nests were especially numerous near there.

PIMPLA SPURIA, Gr.?

BY JOHN B. BRIDGMAN.

P. spuria? — Jet black; legs red; hind tibiæ and tarsi black; the former red-ringed (front coxæ of female, all the coxæ and trochanters of the male, black). Length, 8-9 mm.

Twenty females and one male bred by Mr. W. H. B. Fletcher, of Worthing, from *Depressaria heracliana*, September, 1883.

This insect, at first sight, is very like *P. turionellæ* in length of aculeus and colour of legs, but it is very distinct; in neuration the transverse anal nervure is the same as in *P. examiner*

and *P. turionellæ*; the claws are also the same, that is simple; the spiracles of the metathorax are oval, as in *P. examiner*. Holmgren says they are circular in *P. turionellæ*, but in my specimens they are quite as oval as in *P. examiner*; the cheeks are also long, as in the two other species. In *P. turionellæ* the mesopleura is smooth and shining, as it is also in *P. spuria*; this latter, whilst having in the female the red hind coxæ of *P. turionellæ*, differs from it in having the antennæ quite black, longer, and thinner at the apex; the face is more glabrous, with faint indications of puncture; in *P. turionellæ* the face is distinctly punctured, the antennæ red or red at the base. It also differs from *P. turionellæ* and *P. examiner* in having the ring on the hind tibiæ red and not white, as in the other two species, and it is much narrower. Thomson ('Opuscula Entomologica,' p. 747) describes a species as *P. strigipleurus*, which he says differs from *P. turionellæ* in having a red ring on hind tibiæ instead of a white one, and the mesopleura striated; although *P. spuria* has sometimes very faint indications of striations, it can hardly answer to "mesopleura striated"; he makes no special mention of the black coxæ of the male, and as he mentions the female specially (about length of aculeus, &c.), one may infer he had both male and female; I think therefore that his species is not the same as that now bred by Mr. Fletcher. *P. spuria*, Gr., Holmgr., is included in Mr. Marshall's catalogue as a synonym of *P. turionellæ*.

Herr Brischke, in his list of Ichneumons of East and West Prussia, quotes a variety of *P. examiner* with red hind coxæ: this may be a variety, or it may be a distinct species. Nearly all my specimens of *P. turionellæ* unfortunately are plastered on to cards, so that I cannot examine them at present as closely as I could wish; still, from such examination as I can make, I do not feel certain that there is not more than one species amongst them; one has much stouter legs than the others. From my recent experience it is evident that insects of this genus ought to be pinned, or, if too small, mounted on the apex of a triangular strip of card, so that the under sides can be easily seen. If they are pinned, a fairly long stout pin should be used, and not the short thin abomination at present almost universally used by British lepidopterists: I prefer Tayler's No. 7, and set the insect half-way up the pin.

I have to thank Mr. Fletcher not only for these, but many other bred Ichneumons, a list of which, with their hosts, I hope to publish later on when I have had time to examine them.

Norwich, October, 1883.

ENTOMOLOGICAL NOTES, CAPTURES. &c,

NOTES FROM SHREWSBURY AND NORTH WALES.—My record of this year's work is of a very meagre nature, for our hopes of a good season, of which there was every promise in the early spring, were never realised. A fine and mild April was followed by several weeks of cold, with heavy gales and rain, *Anthocharis cardamines* being very scarce; in fact all the early species were most conspicuous by their absence. June opened well with several scorching days, but only to be succeeded by an extraordinary fall of temperature early in July, fires being in use for several days, and overcoats a necessity. The consequence was that *Satyrus hyperanthus*, *Argynnis aglaia*, *A. adippe*, and *Thecla quercus*, were fully a month late, and then appeared only very sparingly. On the 18th August I started for Llandudno, and was favoured with ten consecutive days of brilliant sunshine, which, however, only helped to show the dearth of insects more clearly. I took a fair series of *Lycæna agestis* in fine condition, including a curious variety, something between *L. salmacis* and *L. artaxerxes*, which I will describe in some future number. I also took several varieties of *L. alexis* having some of the spots on the under side conjoined, and two specimens of the variety *Icarinus*. *Vanessa c-album* was very rare; but *Satyrus semele*, as usual, in large numbers; and *Vanessa cardui* was just appearing when I left on September 8th. The total result falls short even of 1882; and it is to be hoped that we may have at last reached the turning-point for a series of really good seasons to follow.—MARTIN J. HARDING; Cottisbrooke, Shrewsbury, Sept. 28, 1883.

SCARCITY OF LEPIDOPTERA.—Seeing so many reports of the scarcity of Lepidoptera, I cannot help mentioning that, as far as the usual summer species of Diurni are concerned, it has not been so here; for those species usually common, such as *Vanessa io*, *V. urticæ*, and *V. atalanta*, were this year, early in September, quite as plentiful as in previous years, if not more so.—J. V. COTGROVE; Southend, Essex, October 13, 1883.

NOTES FROM YORK.—I worked hard at Sandburn during the last week in July and the first three weeks in August, and have been rewarded by taking a few good things. I succeeded in taking a very fine series of *Scoparia conspiciualis*, about two hundred varieties of *Pœdisca solandriana*, about twenty rich dark brown varieties of *Ypsipetes elutata*, and a specimen of *Mixodia rubiginosana*. I also took two *Aplecta occulta*, a good series of *Noctua neglecta*, about fifty *Orthosia suspecta*, two or three *Acidalia inornata*, and a few *Phorodesma bajularia*, *Geometra papilionaria*, and *Agrotis valligera*. I also obtained a long series of *Cidaria immanata*, one or two forms of which are the best I have seen, looking like that form of *C. suffumata* which has a black central band. Also a fine series of *Thera firmata*, *Epione vespertaria*, and *Lithosia mesomella*; a few of the second brood of *Acidalia inornata*, three *Tortrix cinnamomeana*, *P. occultana*, *Crambus inquinatellus*, and *Noctua glareosa*.—W. PREST; 13, Holgate Road, York, September 20, 1883.

LEPIDOPTERA NEAR MELROSE.—During a residence at Melrose, in August and September, I found the Lepidoptera in that district very plentiful, especially among the Micros, the Eildon Hills also having yielded a fair average of mountain species. The weather was all that could be desired, which is unusual for Scotland as far as my experience goes. Cold bitter east winds, which we often have in July and even August, rather interfere with collecting insects, either on wing or at sugar. Notwithstanding this, I feel sure it would well repay some of our southern entomologists to make a visit to the Border counties; and they seem to me to be very little worked, by the tremendous surprise exhibited by the natives when they meet you with a net. Their imagination does not appear to carry them so far as to suppose you could catch anything with it except fish, which abound in the neighbourhood. Among the Diurni I may mention *Erebia medea*, which have been very plentiful and in good condition. *Vanessa urticæ*, as usual, was in abundance, even on the Eildon Hills at a height of 1385 feet above the sea-level. *V. cardui*, *Chrysophanus phlæas*, and *Cœonympha pamphilus* have been common. I also observed one slightly worn specimen of *Vanessa polychloros*, which is very uncommon in Scotland. The Geometræ have been well represented. *Cidaria russata*, *C. miata*, *C. immanata*, *C. suffumata*, *C. fulvata*, and *Larentia pectinitaria* were very abundant, more especially in

fir woods, from which I also took one fine specimen of *Melanthia rubiginata*. *Larentia cæsiata*, *Cidaria testata*, *C. pyraliata*, *Ypsipetes impluviata*, and *Y. elutata* were common among the heather on the hills, but were generally in a rather bad condition, from a habit they had of pushing their way in amongst the twigs whenever they were disturbed. I also took a few specimens of *Thera simulata* from patches of blaeberry (*Vaccinium myrtillus*). *Odontia dilutata*, in company with *Crocallis elinguaris*, were of frequent occurrence by threes and fours at almost every gas-lamp. *Larentia didymata* were to be found in swarms in every lane, being a perfect pest. *Camptogramma bilineata* and *Melanippe montanata* have been, as usual, very abundant. I took two specimens of *Eupithecia assimilata*, which had been attracted by the light to the dining-room window. With regard to the Noctuæ, which have not been so plentiful as the Geometræ, I observed the following: *Hydræcia nictitans*, *H. micacea*, and *Noctua xanthographa*, which were very common. *Tapinostola fulva* was of frequent occurrence in marshy woods where sedges (*Carex*) abounded. *Charæas graminis* and *Xanthia citrigo* were common on the flowers of the ragwort (*Senecio jacobæa*). *Abrostola triplasia* was to be taken on the common nettle (*Urtica dioica*). *Xylophasia polyodon*, *Cosmia trapezina*, *Mamestra brassicæ*, and *Polia chi*, chiefly at rest on stone walls, which they so closely resemble in colour. *Triphæna pronuba* and *Plusia iota*, with the ubiquitous *P. gamma*, have been very plentiful in this as in several localities in the South of Scotland. I likewise obtained specimens of *Anchocelis litura*. Sugar seemed to have had very little attraction this season. Among the Deltoides, *Hypena proboscidalis* and *H. rostralis* have been very plentiful; and *Aglossa pinguinalis*, *A. cuprealis*, *Botys verticalis*, *B. fuscalis*, *Pionea forficalis*, *Eudorea pyralella*, *E. ambigualis*, and *Simaethis fabriciana*, also among the Pyralites. I also took three specimens of *Choreutis vibrana* from the flowers of the ragwort; I observed several more, which unfortunately I was unable to take. *Crambus pratellus* and *C. hortuellus* were very numerous. The Tortrices have appeared in profusion, the commoner species being even abundant. *Tortrix viridana*, *T. corylana*, and *Ditula angustiorana* were decidedly plentiful; *Dictyoptyryx contaminana* generally common on hawthorn, and *Teras caudana* was to be found in marshy places where salallows grew. *Peronea variegana* extremely abundant on fruit-trees, the larvæ doing a considerable

amount of damage to the foliage. *P. ferrugana* has been very plentiful; and I have taken a few specimens of *P. caledoniana*, which is not uncommon in Scotland. *Ephippiphora argyran* and *Pæcilochroma corticana* were to be taken freely by beating oak and hawthorn. Among many other species I may merely mention *Dapsilia rutilana*, of which I took a few specimens from off the heather. *Cerostoma costella* on oaks, and *C. xylostella* on honeysuckle, have been very plentiful among the Tineinæ. With *Depressaria alstræmeriana*, *Endrosis fenestrella*, *Argyresthea retinella*, *A. brockeella*, *Laverna atra*, *Lithocolletis roboris*, and *L. tenella*, I will close the list of Tineinæ. From the ragwort I took four specimens of *Pterophorus lithodactylus*. It was a pretty sight to see this species, together with the bright little *Choreutes vibrana*, whose colour contrasted so pleasantly with the yellow flowers, flitting restlessly from flower to flower in the bright sunshine. Larvæ in general have been plentiful, but unfortunately were nearly always stung by ichneumons, more especially among those of the Geometræ. The ichneumons have been rather too plentiful, but seemed to be kept in check to a large extent by the much-despised wasps, which have appeared throughout the whole summer in profusion. These wasps preyed largely on the ichneumons, evidently considering them a special relish. I noticed they seized them with their fore legs, and always bit off their heads and wings before eating them, beginning at the thorax and ending with the abdomen. The larvæ of *Bombyx rubi* and *Saturnia carpin* were very abundant among the heather. *Noto-donta camolina* common on birch trees, and *Arctia villica* and *A. fuliginosa* common on almost every wayside herb. I think, judging by my own results, that the Lepidoptera this season, with perhaps the exception of the Noctuæ, have not fallen below the average in number in the districts visited. — WILFRED W. O. BEVERIDGE; 8, Eildon Street, Edinburgh, October, 1883.

LEPIDOPTERA IN SLIGO.—It may perhaps be worth recording that I have taken two specimens of *Emmelesia unifasciata* here this year. They were in fair condition, and I took them at light. I do not know the geographical range of the species, but it is new to me here. Common things on the sand-hills, such as *Agrotis præcox*, *A. cursoria*, *A. tritici*, and *A. aquilina*, have been abundant. *A. obelisca* has been in less abundance than usual. I have seen a few *E. tæniata*; and *Plusia bractea*, although never numerous,

has been more plentiful than during last year.—PERCY H. RUSS ; Culleenamore, August 30, 1883.

CAPTURES AT BEWDLEY. — I had the pleasure of a trip to Bewdley Forest this summer, in company with Mr. Harris, of Burton, and had a most enjoyable day. The place is a most charming one, and must produce many rarities, as it is very varied and of immense extent. We were there in the second week in June, and were favoured with an exceedingly hot day. Many of the ordinary Macros were well represented, but there were none of any special note came in our way. *Lobesia reliquana* was abundant, and odd specimens occurred of *Phoxopteryx biarcuana*, *P. diminutana*, and *P. mitterbacheriana*. *Gelechia aleella* and *G. luculella* were abundant on the oak-trunks; *Lithocolletis roboricolella* seemed everywhere, but rather worn; and I took two examples of *Bucculatrix ulmella*. In one place the larvæ of *Pterophorus spilodactylus* had done their duty as larvæ should. The plants were mere skeletons; I never saw anything more neatly reduced to skeletons than they were. The larvæ had almost all left the plants; there were only six left. We returned at night with fairly well-filled boxes, and quite satisfied with our outing.—J. SANG; Burton-on-Trent, October, 1883.

ABNORMITIES IN BUTTERFLIES.—Last year I bred a specimen of *Limenitis sibylla* in which the right hind wing was entirely absent. In a recent number of the 'Field' Mr. Layard, of the British Consulate, Noumed, refers to a somewhat similar case in a species of moth, attributing the abnormality to injury received in the larval stage, his caterpillar having been accidentally pinched in the fore legs. In my case I had no means of judging, as the insect had been found with others in the pupa state. However, I have frequently met with instances of larvæ slightly attacked by ichneumons (where their terrible enemy, a *Microgaster*, had only succeeded in depositing but very few eggs), and having barely sufficient strength to make the final change, emerging with one or more of the wings curiously deformed or dwarfed, as the following cases show. I have this season bred a *Melitæa artemis* having the corresponding wing to the *L. sibylla* absent; one with the wings on the right side very much dwarfed; another in which one fore wing has quite lost its normal outline; and several specimens of *M. cinxia* and *Vanessa urticæ* similarly deformed.

These abnormities differ materially from the dwarfed imagines that are produced by starving the larvæ. Although Mr. Layard's specimen was suffering from a very different cause to that which I have described, still my evidence will, I think, go a good way to confirm his theory that the perfection of the imago depends in a great measure upon the condition of the insect's health in the larval stage. I hope that the above remarks may elicit the experience of others upon this most interesting subject.—MARTIN J. HARDING; Cottisbrooke, Shrewsbury, Oct. 6, 1883.

COLIAS EDUSA AT EASTBOURNE.—I was pleased to see two notices of *Colias edusa* in the October 'Entomologist,' and should like to record a third. On my way from the High Woods, Bexhill, September 19th, a fine male *Colias edusa* flew over the hedge just in front of me, and preceded me for quite a hundred yards. It continually settled, but having no net I was unable to capture it.—R. M. SOTHEY; Rozel, Eastbourne.

COLIAS EDUSA.—Seeing this insect noticed in the October number of the 'Entomologist,' I think it may interest some of your readers to learn that I observed it in some plenty in the middle of September last, flying in its usual haunts over lucerne and stubble fields, some few miles from Stratford-upon-Avon, though all the specimens I netted were rather worn; a week earlier I also saw several individuals in very fine condition in the Isle of Wight. Previously to this I had not seen a single specimen of the insect since the great season of 1877, although I have visited the Stratford locality several times about the same time of year since then; in 1877 it was very common in the fields where I saw it this year. I also noticed this autumn, in the Stratford neighbourhood, immense numbers of *Plusia gamma*, and an unusual profusion of *Vanessa cardui*; in 1877 these two insects accompanied *C. edusa* in its abnormal appearance; so may not the respective appearances, and in unusual quantities, of these three species have some common cause to produce them? Referring to Mr. J. H. Jenner's notes on *Abraxas ulmata*, I may mention that the insect occurs in great profusion in several localities in Cheshire, though where met with its range of distribution is very limited, often being almost confined to a single coppice.—W. GARDNER; C. 18, Exchange, Liverpool.

COLIAS EDUSA AT SOUTHAMPTON; LACE-WINGS.—On the 14th of September last a single specimen of *C. edusa* was seen flying over a field near Southampton by a friend of mine. This is the only instance within my knowledge of its occurrence here since 1877; but in 1880 I saw two specimens at Sandown, Isle of Wight. In reply to Mr. McRae (Entom. xvi. 235), I can testify to the unusual abundance of lace-wings (*Hemerobius*) this year. A lime-tree round which I was mothing one evening last July was almost alive with countless numbers of them; but unfortunately their odour did not match their beauty.—H. E. U. BULL; The Elms, Foundry Lane, Southampton, October 2, 1883.

COLIAS EDUSA IN HAMPSHIRE.—Having noticed the records of the appearance of *Colias edusa* in Nottingham and Gloucestershire this season, I may mention that in this locality during September I counted twenty-three specimens at various times, six of which I succeeded in capturing. In no season since 1877 have I seen more than one or two specimens. If the septennial theory of the abnormal occurrence of this lepidopteron is to hold good, we may look forward to the spring and autumn of 1884 with some degree of confidence of being able not only to renew our sets of the normal type, but also of enriching our collections with some of the prized and interesting varieties of the female *helice*.—W. McRAE; Bedford House, Bournemouth, October 15, 1883.

COLIAS EDUSA.—Again I have seen but a single specimen of this butterfly; this a male, first noticed in a lucern-field on Sept. 17th, where I have seen it almost every day since until Sept. 29th, when I met with it late in the afternoon, after a heavy storm, under the hedge, looking very feeble and worn; it could but just manage to flutter about.—EDWARD A. FITCH; Maldon, Essex.

COLIAS HELICE.—While my brother, Arthur Brabon, was engaged taking *Vanessa cardui* on Monday, September 17th, on some waste ground off the Lea Bridge Road, he was fortunate in taking a specimen of this pale variety of *C. edusa*. It would be interesting to know if other specimens have occurred so near London.—G. F. BRABON; 48, Shakspeare Rd., South Hornsey, N.

ACHERONTIA ATROPOS NEAR SOUTHAMPTON.—I am glad to be able to record a capture of this interesting moth near Southampton. It was found on the bed-room door of a house at Woolston, and is now in the collection of a friend of mine.—

H. E. U. BULL; The Elms, Foundry Lane, near Southampton, Oct. 15, 1883.

CHÆROCAMPA CELERIO IN ESSEX. — Mr. Murray exhibited a specimen of *C. celerio* at the East London Entomological Society, which was captured by a workman at Messrs. Howard & Sons, City Mills, Stratford, on September 28th. — D. PRATT; Hon. Secretary, East London Entomological Society, 333, Mile End Road, London, E.

LASIOCAMPA ILICIFOLIA, &c., FROM CANNOCK CHASE. — The following notes on the Lepidoptera to be obtained around Rugeley and Cannock Chase may be of interest:—The greatest rarity to be obtained in the district is *Lasiocampa ilicifolia*, and I have not read of one being taken for the last half-dozen years. I had the good luck to find three larvæ in 1879, and found two last year, but they seem to be very delicate, for I only succeeded in rearing one imago. I have no doubt, if the district were properly worked, many more might be obtained, but they are very difficult to find, as they repose in the daytime on twigs of the heather, preferring dead or old twigs. I suppose they feed at night; I have never found any feeding or even resting on their food-plant, the bilberry (*Vaccinium myrtillus*). If any one would give me a few hints on finding and rearing them I should be much obliged. I know Mr. Weaver and other entomologists many years ago obtained large quantities of the larvæ from the locality, and I hope next year I shall be able to discover the haunts of this rare insect. The rest of the lepidopterous fauna of this region do not call for much comment. The best I have taken are *Thecla betulæ*, *T. rubi*, and *Argynnis aglaia*. The only hawk-moth I have is *Chærocampa porcellus*. Among the Bombyces, *Hepialus lupulinus*, *Notodonta camolina*, *Cilix spinula*, *Bombyx rubi*, *Saturnia carпинi*, *Lasiocampa quercifolia*, *Arctia fuliginosa* are the best. The Noctuæ are numerous, but no great rarities have come to hand, the best being *Plusia festuæ*, *Abrostola triplasia*, *Miana fasciuncula*, *Polia chi*, *Hadena thalissima*, *Agriopis aprilina*. This year I have taken absolutely nothing. I sugared for a whole week on the skirts of outlying woods, and the result was three *Mania maura* and any number of *Xylophasia polyodon*. There have been great numbers of *Leucania pallens*, and later, *Plusia gamma*, but besides these the year 1883 proved a blank.—R. FREER; Caius College, Cambridge, Oct. 22, 1883.

VARIETY OF THE LARVA OF SATURNIA CARPINI.—Among some larvæ of this species, taken by me on some moors near here during this month, is one in which the normal green colour is replaced by glossy black, there being a band of dull green between each segment. The tubercles, instead of being pink, are bright lemon-yellow. I was not aware that this larva is subject to variation, and shall be glad to hear from any of your readers whether any varieties have come under their notice. I may add that it was not until the last change of skin that the larva in question showed any signs of variation.—G. SHUTE, jun.; Fairfield Road, Chesterfield, August 13, 1883.

THE DISTRIBUTION OF ABRAXAS ULMATA.—With reference to a note (Entom. xvi. 236) on the extent of the distribution of this insect, I may say that I have taken it in two localities in North Lancashire, viz., near Preston, and in this neighbourhood. I also captured a single specimen at sugar near Longleat, on the borders of Somerset.—H. T. HUTCHINSON; Whalley, Oct., 1883.

SYNIA MUSCULOSA AT BRIGHTON.—I have been fortunate in capturing a specimen of *Synia musculosa* here on clover-heads, flying in the daytime; also a beautiful variety of the female of *Lycæna corydon* with blue under wings.—W. E. PARSONS; 57, Cavendish Street, Brighton, October, 1883.

DESCRIPTION OF THE LARVA OF CELÆNA HAWORTHII AND OF NONAGRIA FULVA.—During the month of July my brother and I took a number of larvæ of *Celæna haworthii* and *Nonagria fulva*, feeding in the roots and stems of the cotton-grass. As there does not seem to be an adequate description of the larva of either species, I append one taken from my notes. *Celæna haworthii*.—The head is of a pale brown colour, and is slightly smaller than the 2nd segment. The body is soft and thick, and covered with minute hairs; it is of a dirty whitish colour, with several small dark spots on each segment; there is a brown corneous plate on the 2nd and 13th segments, and an irregular blotch of brown on the lateral aspect of the 3rd and of the 4th segment. *Nonagria fulva*.—The head is very small, and is of a pale brown colour. The body is about an inch in length, and is stout, smooth and very firm, cylindrical in form, and attenuated at both extremities. The skin, which is very tightly stretched, is semitransparent. The ground colour of the body is pale whitish green. On the

dorsal aspect of each segment there is a large brownish pink blotch, through the centre of which there runs a fine line of a pale yellow colour. There is a very slender, dark, spiracular line, or rather series of dots. — W. HOWARD CAMPBELL; Ballynagard House, Londonderry, September, 1883.

CURIOUS SITE FOR OVIPOSITION BY *TRIPHÆNA PRONUBA*.—In July last I observed a female of the above named at rest on a string supporting some nasturtiums. It stayed there the whole evening, despising the attraction of "sugar," which was spread close to it. In the morning the moth was gone, but my attention was attracted by an apparent thickening of the string with a white excrescence, which upon closer examination proved to be eggs. Some fortnight after I found another batch deposited in a similar position. The eggs are of a pearly white colour, and it seems somewhat curious that the string should be selected in preference to the vegetation in the immediate vicinity.—C. S. BIGGS; 3, Stanley Terrace, West Ham Park, E.

ARGYRESTHIA GLAUCINELLA NEAR LEICESTER.—I took a journey this summer to Leicester, in the hope of again taking this rare species, which I met with there in fair quantity some years ago. I found them very scarce, and was correspondingly disappointed. The only other captures of interest were *Xysmatodoma melanella* and *Bucculatrix ulmella*, singly. When there before I took over a hundred *Argyresthia glaucinella*, and might have taken any quantity. *X. melanella* was not very uncommon, and *Tinea fulvimitrella* and *T. semifulvella* well represented, both of which were absent on this last occasion.—J. SANG; 181, Horninglow Street, Burton-on-Trent.

SINGULAR ABERRATION OF *GRACILARIA SYRINGELLA*.—While beating a birch tree in a wood this summer my attention was drawn to a small dark moth flying about the hyacinth flowers. I netted it, and on sight of it in the net and then in the box I was quite sure I had met with *G. populetella*, and that I had disturbed it from the bush I was beating. I was very much surprised, when I had chloroformed it and turned it out, to find that it was not that insect, but a dark, almost unicolorous, grey variety of *syringella*. Further search at the time produced no more, and I failed afterwards either to capture or breed it. In this example the usual whitish ground colour is replaced by a leaden grey, the

brown markings showing faintly upon the ground colour. — J. SANG; Burton-on-Trent, October, 1883.

ELACHISTA (? n. s.), &c. — I had the good fortune to capture, one evening in June last, in some marsh ground (since unfortunately tabooed), a pair of a white *Elachista*, with rather large black spot, identical with a specimen which I bred when at Darlington. I submitted it to Mr. Stainton and Professor Zeller, by both of whom it was returned as unknown to them. The manner of flight was so exactly like that of *Opostega crepusculella* that, until I had the insect in the net, I thought it was that species. The evening turned chilly, and there were no more to be had. In another locality I turned up *Elachista paludum*; they were unfortunately seriously ichneumonised, only one in ten emerging. Also, in the same place, very young larvæ of *Elachista monticola*, both new to this neighbourhood. I missed the latter afterwards by not going again for them till after they had left the plants. I never was able to find the pupæ of either species *in situ*; they must wander away from their food-plants. — J. SANG; 181, Horn-inglow Street, Burton-on-Trent.

EXTRAORDINARY NUMBER OF APANTELES GLOMERATUS INFESTING PIERIS BRASSICÆ. — In walking through a garden on the 14th inst., I observed a large caterpillar of *Pieris brassicæ*. Knowing a friend wanted some extra fine specimens of this butterfly for his collection, I thought I had a prize for him, so brought it home and made him a present of it. In a few days an extraordinary number of larvæ of *Apanteles glomeratus* escaped from it, and spun up. Disgusted at finding the poor wretch, three days afterwards, was still alive, my friend returned it to me. Not having seen such a number of cocoons from a single specimen I counted them, and found they amounted to one hundred and forty-two. — G. C. BIGNELL; Stonehouse, Plymouth, September 28, 1883.

PECULIAR MISTAKE OF DYTISCUS MARGINALIS. — I have frequently noticed in the early morning, and especially after moon-light nights, the above-named large aquatic beetle on the roof of my greenhouse. There being no water of any size in the immediate vicinity, it has often puzzled me to account for their being there, and it has just occurred to me that the beetle, in its flight in quest of fresh fields and pastures new, may mistake my

greenhouse for a sheet of water. I should be pleased to know if others have had a similar experience, as it tends to show that the insect is guided more by the sense of sight than by smell.—G. L. McDONALD ; Saffron Walden.

CRYPTORRHYNCHUS LAPATHI.—In June, 1882, I observed in one of my rambles a sallow bush that was attacked by some internal feeders, which on examination proved to be the larvæ of a beetle. I broke a piece off the bush, and brought it home for a friend, who some time afterwards informed me that they had changed to a beetle that neither of us knew at the time, but have since made out to be *C. lapathi*. Being asked to get him some more of them, I went again to the place on September 12th and found the perfect insects were in the burrows made by the larvæ, and not at all inclined to move from them; by which I concluded they must pass the winter in that way, which afterwards proved correct. Not being much interested in beetles at that time, I took no further notice of them, but happening to pass the place in the beginning of April this year, I bethought me of the beetles and went to look at them, and found them in the same state I had left them in last September: they had not moved in the least. I broke off a piece about a foot in length and an inch in diameter, which I split up when I got home, and got over twenty beetles out of it. When getting them out I noticed they gave a little squeak, which was repeated when held between the finger and thumb, and also when I dropped them into hot water to kill them; they were all of the pink colour mentioned by Mr. Bignell (Entom. xvi. 214). I intended to have kept a watch on the bush to have further observed the habits of this species, but some of the pic-nic parties very shortly afterwards broke the bush off—as it was quite dead—and burnt it, so that it put an end to my observations. I have no doubt the bush must have contained some hundreds of individuals, as it was infested from the ground to branches no thicker than your finger.—JOHN HILL; Whittaker Lane, Little Eaton, Derby, September 12, 1883.

DOUBLEDAY COLLECTION AT BETHNAL GREEN.—I have pleasure in informing your readers that the Doubleday Collection keeps up its interest among entomologists, and that it is visited by large numbers for the purposes of reference and examination.—F. COLES; Bethnal Green Museum, October, 1883.

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NOTES AND OBSERVATIONS ON THE PAST SEASON.

BY RICHARD SOUTH.

IN the localities I have visited during the past season I found Macro-Lepidoptera decidedly scarce, except in one or two notable instances, to which more particular reference will presently be made; on the other hand, many species of Micro-Lepidoptera were especially numerous. In this respect my experience would seem to coincide with that of other collectors.

As to the causes at work which influence the propagation of some species of insects and the suppression of others, I have but little to say beyond intimating my conviction that electrical and other meteorological conditions have a potent effect upon insect-life generally.

It would perhaps be difficult to point out what meteorological conditions would be considered favourable, but as we certainly observe a decided diminution of tree and plant foliage-feeding species of Lepidoptera after abnormally severe weather (as, for instance, in the spring of 1882), it would seem not altogether unreasonable to suppose that meteorological influences having a beneficial effect on vegetation would also be favourable to foliage-feeding insects. Such an hypothesis is, however, hardly tenable in face of the contrary experience of many of us during the past season. Electrical disturbances have been frequent and often of an exceptionally violent character this year, both at home and abroad. May not those electrical storms have had much to do with the paucity of Lepidoptera in some districts this year?

It has occurred to me that if the entomologist, more especially the lepidopterist, would take up the study of meteorology, and carefully compare the results of his research in both branches of

science, he would possibly throw considerable light on this matter, and enable us to arrive at some more definite knowledge of the natural laws which govern insect-life than we appear to possess at present. Before leaving this subject I may refer to an occurrence with which most collectors are doubtless acquainted, viz., the great activity displayed by insects when a thunderstorm is impending; and again, how often it happens, after a heavy thunderstorm, that insects become suddenly scarce.

Having thus briefly given expression to my views concerning the scarcity of Lepidoptera, I will proceed to jot down a few notes of my entomological captures and observations during the past season. Towards the end of April and during May I found larvæ exceedingly abundant in every hedgerow about Kingsbury, Harrow, and Mill Hill, in Middlesex. These were chiefly *Nola cucullatella*, *Hybernia rupicaprararia*, some common *Micros*, such as *Teras contaminana* and *Sciaphila nubilana*, with a sprinkling of *Dictyopteryx holmiana*, *Penthina ochroleucana*, and *Sideria achatana*. On herbage growing in ditches, on banks, or waste places, a goodly number of *Chelonia caja* larvæ were to be obtained. I collected a number of these and fed them up on coltsfoot and lettuce, putting some under various coloured glass, others in complete darkness, and in fact employing all the artifice I thought likely to assist in causing some variation in the future imagines, but I need hardly say that I was not successful in obtaining a single aberrant form of *C. caja* from these larvæ. On the other hand, from some pupæ sent me from Scotland, which had been fed up in the open, I got one example which differed from the type in having the basal half of the left-superior wing of the usual cream-colour, but with the chocolate markings only indicated on the inner margin at the base and towards the costa. This specimen is deformed; one or two of the other specimens are very dark, the chocolate pigment predominating to a considerable extent.

Imagines of *Coccyx splendidulana* were abundant near Hendon, and, as the circumstances attending the capture of this species were new to me, I venture to give an account in detail. I should state, in the first place, that in previous years I had only met with single examples of this species, either at rest on the trunks or beaten from the boughs of oak trees; but at Hendon this year the insect must have been in hundreds among

the branches of the oak trees about which I at first netted and afterwards jarred or beat it. Between three or four o'clock on a fine, and at intervals sunny, afternoon, favoured by a gentle south-west breeze, I was walking by the side of a thick hedge bordering a large grass field; in the hedgerow were three oaks of moderate size, situate some thirty yards or more apart. As I was passing along, tapping the hedge as I went and netting any insect disturbed therefrom, I presently found that I had two examples of *C. splendidulana* in my net, captured at one sweep; having boxed the pair, I noticed that I was just under the larger of the three oak trees referred to. Looking up, I observed a number of the *Coccyx* dancing around and about the extremities of the branches. At this moment the sun was shining, and continued unobscured for some fifteen minutes, during which time I captured about thirty specimens; the bulk of the insects were, however, flying high up, and quite out of reach; presently clouds passed over the sun, and the gambols of the Tortrices ceased. The wind, too, at this moment had somewhat increased in force, and I thought it would be useless to beat for more specimens, as I quite expected the wind would carry away any that might be dislodged from the tree; at the same time I gave the tree a kick with my foot; this operation, however, seemed at the time somewhat futile, as far as the particular object in view was concerned, albeit the effect on my toes was one not to be lightly incurred again. On turning round with my back to the hedge, and consequently to the wind (for one always works on the lee side of a hedge), I was pleased to see *C. splendidulana* beating up against the wind, and making strenuous efforts to regain a resting-place in the friendly branches of the oak. Keeping the net at work among the evicted as long as I could see one within reach, I found that I had made no less than seven prisoners in that engagement. Owing to the sturdy nature of the oak trunk I was inclined to think that some other cause was at work in the dislodgement of the insect, but, after watching some time and not seeing any more moths on the wing, I essayed another jar—this time it was with a heavy hedge-stake; in response thereto the very much shocked refugees tumbled out in numbers, were carried by the wind some little distance from the hedge, and then fell among the grass. From their hiding-places, however, they presently arose and flew back towards the

tree, when, as before, all that came within reach were captured, and, at the end of this second *melée*, I had eleven in my net. After continuing this little amusement for some thirty or forty minutes I found I had filled all my boxes, and in one or two of them was a beautiful aberrant form of *Coccyx splendidulana*. I should mention that this species remains quietly in the net, and allows itself to be boxed without fuss, unless the sun is shining, under which influence it is rather lively. It did not occur on either of the other two oak trees.

At Mill Hill, in May, *Procris statices* swarmed in a field near the Midland Railway Station; a number of stunted plants of *Lychnis flos-cuculi* grew in this field, and the *Procris* showed a predilection for the blossoms of these plants. *Dicrorampha sequana* and *D. plumbagana* were very abundant on a railway-bank also near the Mill Hill Station.

In July, at Kingsbury, I observed *Semasia janthinana* flying in abundance over the tops of the highest hawthorn-hedges in the sunshine, about five o'clock in the afternoon; this is another species I have never met with in any numbers before. Three specimens of *Phtheochroa rugosana* were captured as they sat on the bramble-leaves in a hedge bordering a field. I could only discover two small vines of *Bryonia dioica*, so possibly this was not the head-quarters in the district of either plant or insect. On an oak-tree in the same hedge I found an example of *Eupœcilia sodaliana*, and was somewhat puzzled to account for its presence there until I met with a buckthorn (*Rhamnus catharticus*) bush on the other side of the field; I did not, however, get any more of this handsome Tortrix. *Grapholitha trimaculana* was in such abundance that it would be no exaggeration to say that some palings were simply covered with it, so numerous was this species. *Gelechia vulgella*, *G. luculella*, and *G. aleella*, together with *Æcophora lunarella*, were all rather common on old palings and fences.

At Box Hill *Setina irrorella* was plentiful, as also were *Pyrausta ostrinalis*, *Crambus pascuellus*, *C. culmellus*, *Oxyptilus parvidactylus*, *Mimæseoptilus pterodactylus*, and *Aciptilia tetradactyla*; and at Sanderstead, although *Eupithecia sobrinata* was quite as numerous as I have usually found it there, *Chrosis rutilana* did not occur nearly as freely as I have sometimes known it to do among the junipers at that place.

During the month of August, at Ventnor, in the Isle of Wight, I met with a few species in considerable numbers. Of these I may mention *Lycæna agestis*, *L. corydon*, and *L. alexis*. Of the last-named I also captured five examples of the aberrant form *icarinus*, and others intermediate between it and the type. Of *L. corydon* I got one female with all the wings beautifully suffused with blue, and three or four female specimens quite different to any that I have seen before. The wings, especially the inferior pair, are shot with blue; the black discoidal spot on fore wing is encircled with white; before the dark brown or blackish hind-marginal band is an indistinct bluish white band, interrupted by the blackish wing-rays; hind wings with blue discoidal spots. *Ænectra pilleriana* was not so plentiful at Ventnor as I found it there in 1879; possibly I was a little late, as several of those I captured were much wasted. In the Ent. Mo. Mag., vol. xix., page 135, is a description of the larva of this species by Mr. C. G. Barrett. The food-plant given by that gentleman would appear to be *Statice limonium*. The habitat of this plant is one in which I should hardly have expected to find *Æ. pilleriana*. In the Isle of Wight I have always found the insect on warm sunny banks, never in places likely to be excessively moist at any time. The fact of *Æ. pilleriana* feeding on *Statice limonium* surprises me, although I have reason to know that its larva feeds on several plants growing in such places where I take the moths referred to in the Isle of Wight; and were it not for the well-known accuracy of Mr. Barrett in identifying closely allied species of the British Tortrices, I should be inclined to doubt his assertion that *Ænectra pilleriana* was bred from larvæ found feeding on a plant which only occurs in salt-marshes or on muddy shores. Mr. Barrett, however, has had the opportunity of comparing the species he bred with types of *Æ. pilleriana* from the Continent, as also with specimens given him by Mr. Bond; so that there really seems to be no room for doubt in the matter.

Catoptria pupillana was very common among plants of *Artemisia absinthium*; I have often looked for this species among *A. maritima* in several places, but always without success. This year I got a large number of specimens by searching the old and somewhat scrubby plants of *A. absinthium*; the insect was often at rest on the foliage in the morning, but in the afternoon would

more often be found on the lower twigs or stems near the ground; they were made to discover themselves by gently passing the hand between the twigs, when the insects would scramble out of their retreat and run up among the foliage; from thence they were easily boxed. Very rarely one would take wing, but it never flew far, generally alighting on the grass within a few feet of the plant from which it had been disturbed. I have never seen this species flitting about, as do many others of the genus, although I have watched for it at all hours. *Eupæcilia roseana* was one of the most abundant Micros met with in the island; wherever a few teasle-heads were to be seen there also would be *E. roseana* in force; and very large examples, too, were some of them, but somewhat wanting in the brilliancy of bred specimens. I must name a few other insects observed in the Isle of Wight, simply because they were common there. Among them were—*Urapteryx sambucaria*, *Acidalia bisetata*, *Aspilates citraria*, *Melanippe procellata*, *Ortholitha bipunctaria*, *Miana bicoloria*, the aberrant forms *furuncula* and *rufuncula*; *Pyrallis costalis*, *Pyrausta punicealis*, *Botys asinalis*, *Crambus tristellus*, *Peronea aspersana*, *Stigmonota compo-sana*, *Dicrorampha politana*, *D. petiverana*; these last two species could sometimes be netted by the dozen; *Catoptria cana*, *Mimæ-seoptilus bipunctidactylus* and *Acipitilia baliodactylus* complete the list. Wasps were not uncommon, *Vespa vulgaris* being especially abundant among rough herbage in one or two places along the coast.

Boarmia repandaria—about forty larvæ of this species were obtained from North Devon in April; they were found feeding on bilberry (*Vaccinium myrtillus*) and heather. When they came to hand some were nearly full-fed, whilst others were less than half-grown; as I could not readily obtain either bilberry or heath, when the supply of food which came with them was exhausted I gave them plum-leaves from trees growing in my garden. In due course thirty-five imagines made their appearance, varying in coloration from a pale grey to a brownish black, and including no less than sixteen fine examples of the aberrant form *conversaria*. I need hardly say that *Boarmia repandaria* larvæ are frequently found on hawthorn, sloe, and elm; but I do not know of an instance where larvæ fed exclusively on either or all of these three kinds of pabulum produced the aberrant form above alluded to. It must not be inferred, however, that I attach any

particular importance to food as a factor in the production of such aberrations. Mr. Grigg, of Bristol, was also kind enough to send me nineteen larvæ of *Boarmia repandaria*, part of a brood from a banded female. These were about half-grown when I received them, and had been fed so far on birch. I supplied them with plum, which they took to kindly, and attained a considerable size before entering the earth for pupation. Eventually ten very large imagines of the ordinary form and nine equally large of *conversaria* emerged. The sets of each form were very uniform in tone of coloration and character of marking, in both these respects contrasting strongly with imagines from the collected larvæ from North Devonshire.

12, Abbey Gardens, St. John's Wood, London, N.W., November, 1883.

FURTHER NOTES ON THE SEASON; WITH CAPTURES IN WEST NORFOLK.

BY EDWARD A. ATMORE.

IN the September number of this Journal some remarks of mine appeared bearing on the season, with an enumeration of my principal captures up to the beginning of July; and thinking that a short summary of my further captures from that time to the present might prove interesting, to at least some of your readers, I have again ventured to pen a few lines.

Wet weather, as stated in my last contribution, set in at an early date in July, and much to my regret continued during the greater part of that all-important month for collecting; however, taking advantage of a few fine intervals, I found—certainly rather to my surprise—that not a few species were fairly represented, although they mostly showed unmistakable signs of the prolonged moisture to which they had been exposed; many of the Macrolepidoptera were so worn that I found it a difficult matter to recognise the species to which they belonged.

During my short visit of two days to the coast I encountered more wind than could be deemed desirable for such an exposed situation, and on the second day rain again fell in torrents during the afternoon and evening, so that I was unable to make the best of the two days at my disposal. The best capture I made there was undoubtedly four specimens of the much-

coveted *Anerastia farrella*; these were larger than those of previous years, but rather worn. On an adjoining salt-marsh I found *Eupæcilia vectisana* in plenty, flying (as many of the *Eupæciliæ* do) most freely in the afternoon; but was rather disappointed in my fruitless search for larvæ of *Agdistes bennetii* on the sea-lavender (*Statice limonium*), which grew there in plenty. Amongst other species met with on the coast I note *Leucania littoralis*, *Macroglossa stellatarum* (of frequent occurrence), *Crambus warringtonellus*, *C. inquinatellus*, abundant and variable, and some nice varieties of the common *C. hortuellus*; *Semasia janthinana*, *Chrosis tesserana*, *Coleophora therinella*, and a few *Gelechia pictella*, *G. instabilella*, *G. tæniolella*, *G. atriplicella*, and *G. distinctella*, with swarms of commoner *Gelechiæ*, such as *G. marmorella* and *G. desertella*; the two latter species when disturbed fell out in numbers on the sands. *Satyrus semele* was just emerging, several worn specimens of *Vanessa cardui* were seen, and *Plusia gamma* still kept up its reputation for ubiquity.

To return to inland collecting, I observe that *Lycæna ægon* was comparatively scarce on our heaths; whilst the larvæ, cocoons, and imagines of *Zygæna trifolii* were unusually abundant. Towards the end of July and beginning of August *Eupisteria heparata* was again out in fine condition, and tolerably common, among alders. Surely this species must be double-brooded! *Coremia quadrifasciata* I quite failed to get in good condition, although worn specimens occurred from time to time; some of these placed in boxes very kindly deposited eggs. *Acidalia incanaria* was common, *A. scutulata* and *A. bisetata* were frequent, and *A. inornata* and also *A. emarginata* occurred sparingly. *Lithosia griseola* flew in plenty at dusk; but only a few of the more highly-prized *L. stramineola*; *L. mesomella*, with some interesting varieties, was also met with. Of the *Pterophorina* only *Pterophorus bertrami* and *P. acanthodactylus* are worth mentioning. Among others the following were taken or observed:—*Xylophasia scolopacina*, disturbed by day in woods; *Nonagria despecta*, *Leucania phragmitidis*, and *Hepialus sylvinus*, the latter common, and remarkably fine both in size and colour; *Orthosia suspecta*, *Noctua umbrosa*, *Thyatira batis*, *Hydræcia nictitans*, *Agrotis nigricans*, and *A. tritici*, at sugar; *Epione apiciaria*, *Platypteryx falcula*, *Eupithecia coronata*, and *Rhodophæa consociella*, flying at dusk; while *Crambus latistriellus* and *C. ha-*

mellus, always plentiful in one chosen locality, were more numerous than I have ever before seen them; *C. pinetellus* and *C. geniculellus* also occurred, but in more limited numbers. *Charæas graminis*, *Pyrallis glaucinalis*, and *Paraponyx stratiotalis*, were noticed at light.

Of the Tortrices, *Tortrix viburnana* was common; I note that its curious females, with their much reticulated and narrow pointed wings, are difficult to obtain, although they can be had in plenty from larvæ on *Myrica gale*. *Tortrix lafauryana* did not fail to occur in its usual numbers, and from a good supply of larvæ a fair proportion of females was secured; for like the former the female is scarcely ever seen on the wing. *T. cratægana* was tolerably common, but only found in one wood. Among others taken I note *Peronea favillaceana*, *P. schalleriana*, *P. aspersana*, *Argyrolepis badiana* (its allied species, *A. cnicana*, usually occurs annually, but I have not observed it this year), *Xanthosetia zoegana*, *Grapholita nisana*, *Ephippiphora ephippiana*, *E. bimaculana*, *Penthina betulæana*, and *E. dubitana*. *Dicrorampha politana* and *E. angustana* absolutely swarmed on our heaths.

King's Lynn, November 7, 1883.

NOTE ON A NEW FORM IN THE GENUS ZYGÆNA.

By W. PREST.

DURING the last week in July I bred a specimen of the genus *Zygæna*, which seemed to me quite different to anything I had seen before. I went the next day to where I got the pupæ from among which it appeared, and by hard work I took six more, flying in company with *Zygæna lonicæræ*. I looked several times afterwards, but could find no more like the particular form I am about to describe. When flying they have a rather washed-out appearance, and that may account for my not taking them before.

The insect under notice is not quite so robust in appearance as *Zygæna lonicæræ*. The anterior wings look a little more pointed than that species; the colour of those wings is steel-blue, and they are more sparsely covered with scales than in *Z. lonicæræ*; posterior wings and spots pink, *not crimson*; the border of posterior wings is brown, *not black*; and the cilia of all

wings *whitish*, instead of being black, as in *Zygæna lonicerae*, *Z. trifolii*, and others of the same genus; antennæ seem rather finer; and it is altogether a very curious-looking insect.

Many gentlemen in London have seen the specimens to which I refer, but no one would give a direct opinion as to what they are. I went to compare them with the examples of the genus in the British Museum at South Kensington, and saw, by the kindness of Mr. Kirby, all their specimens of *Zygæna*; also those in the collection of Professor Zeller. I further went to Bethnal Green Museum, and saw all in the Doubleday collection; but did not find an insect in either which is at all like my specimens.

I venture to think it is fair to presume that it is either a species new to science, or a good local form; and as such I have great pleasure in provisionally naming it *Zygæna eboracæ*, in honour of the locality which has afforded me so much pleasant entomological study, Ebor being the ancient name of York.

My opinion is that it is a good local form of *Zygæna lonicerae*, for it cannot be *Z. trifolii* nor *Z. meliloti*, because neither species occur in this district.

13, Holgate Road, York, November 12, 1883.

ENTOMOLOGICAL NOTES, CAPTURES. &c,

PRESENTATION TO MR. JOHN T. CARRINGTON.—It is seldom that entomologists have experienced such genuine pleasure as fell to the lot of those who attended the meeting at the Royal Aquarium on the evening of the 5th November last. Although the usual business of the first Monday in the month, *viz.*, the exhibition of specimens, was as interesting as usual, yet the presentation of a handsome mahogany entomological cabinet (made by Brady) to Mr. John T. Carrington formed the chief feature of the occasion. It contains fifty-four drawers, 20 in. by 18 in., arranged in three tiers; and forms a fitting present to one whose labours have added much to the cause of Entomology. The presentation was made, in the name of the numerous subscribers, by Mr. J. Jenner Weir in a happy speech; and I am sure that he expressed the sentiments of all present when he observed that the meetings there had been among some of the

most pleasant in his entomological career. "So free from any restraint, so unconscious of the presence of the host," will convey a fair idea of the tenour of his speech, and no better words could have been used. Mr. Carrington, in a few terse words, while thanking the subscribers for their present, claimed the bulk of the pleasure of the meetings for himself, such pleasure he said, with his accustomed good nature, being far more than recompense for any trouble to which he might have been put. "To see most of my old entomological friends around me is one of the greatest pleasures that can fall to my lot," was heard with satisfaction by all. It must have been felt by all present that the opportunity of meeting once a month at these réunions is a great boon, and one which entomologists cannot appreciate too highly, as it not only calls together old friends, but brings to a focus much of the work done, especially around London, during each summer. These gatherings average about thirty-five to forty, and many rarities are there exhibited which might otherwise never be seen by those who are interested; and while many local societies hold exhibitions at various times, those at the Royal Aquarium stand pre-eminent. A cursory glance at some of the exhibits on this evening will bear out this statement, although the general scarcity of the past summer was evident in the number of boxes shown being less than usual. Still, however, the well-marked specimens of *Argynnis lathonia*, taken at Dover this year; the very pale, in fact yellow, variety of *Vanessa urticae*; the widely varied under sides of *Lycæna adonis*, exhibited by Mr. E. Sabine, were as interesting as the living larva of *Plusia bractea*, brought over specially from Ireland by Mr. Percy Russ. The specimen of *Crambus myellus* shown by Mr. Julius Jäger was very good, as likewise were his dark forms of *Hydrocampa nymphæalis*, his variety *chantana* of *Peronea cristana*, and his long row of *Erastria venustula*; and the *Pterophorus acanthodactylus* bred from *Stachys sylvatica*, exhibited by Mr. Richard South, drew much attention. *Vanessa urticae* seems to have been subject to considerable variation this year, for Mr. F. L. Burney showed some of extraordinary character; so also has *V. atalanta*, for several could be seen in various boxes, although the aberrations were not in such striking degree. That of Mr. J. A. Clark is worth mention, the crimson colour of the margin of the hind wing being considerably extended. In the same box was a dark

form of *Cidaria suffumata* of quite a northern type, taken at Chingford; and a specimen of *Acronycta leporina*, taken at Abbot's Wood, having a dark blotch of some extent on the right wing. Mr. Wm. Machin's long row of *Geometra smaragdaria* formed one of the most popular exhibits of the evening, and were well calculated to excite the feeling of envy. A series of *Nonagria elymi*, and one of the local form of *Eupithecia nanata* from the Island of Unst, appeared in Mr. Carrington's box. Some exceedingly well-set specimens of *Coremia quadrifasciaria* were shown by Mr. J. T. Williams; and the long and varied row of *Nola centonalis*, bred by Mr. Robert Adkin, were looked at more than once. The Tortrices shown by Mr. H. Payne were not without interest; and Mr. R. G. Burry, secretary of the Haggerston Entomological Society, showed a male *Fidonia piniaria* in the guise of the female. The host of specimens exhibited by Mr. T. W. Hall, among which were noticeable a yellow variety of *V. atalanta*, *Pieris cratægi* from the New Forest, a row of *Tethea subtusa*, and several *Dicranura furcula*, go far to show that there are some diligent workers in the field. Many other exhibits were remarked, although the presentation was the chief feature of the evening; and we trust that the cabinet will prove a source of pleasure to its present possessor, and frequently remind him that there are those who feel grateful for his constant endeavour to assist with equal courtesy the poor gardener who comes with his destructive larvæ for identification, or the rich collector with his unnamed specimens.—W. H. WRIGHT; Secretary's Department, Inland Revenue, November 7, 1883.

NOTES ON THE SEASON FROM CROYDON AND ELSEWHERE.—The season has been on the whole one of scarcity, at least in the first half of it, but some species have been unusually abundant. During the mild January *Cheimatobia boreata* and *C. brumata* were common at West Wickham; *Hybernina defoliaria* was not very scarce; *H. leucophæaria* was in tolerable abundance, though not so common as in former years, and one specimen of *Phigalia pilosaria* was taken. In February several of these species continued, and towards the end of the month *Hybernina progemmaria*, *Anisopteryx æscularia*, and *Tortricodes hyemana*, but the two former were much scarcer than usual; and *H. rupicaprararia* was not seen at all. These continued till the 4th of March, when the weather became so cold that for three weeks nothing

was seen. During February I noticed, at night, an unusual number of larvæ of a *Noctua* unknown to me; so common were they that, if I had taken the trouble of collecting them every night, I could have obtained thousands; they were brownish, with paler lateral stripes, and two rows of black dorsal spots. Although I took over a hundred, and several formed cocoons, yet I got no pupæ. I saw no *Lepidoptera*, except *Tortricodes hyemana* and one or two *Hibernia progemma*, till the 24th of March, when, although the weather was very cold, the sun shone brightly; I then met with one specimen of *Brephos parthenias*. In a few days the weather became warmer, and *Diurnea fagella* then appeared. I noticed this year that a very large proportion were a very dark grey or nearly black variety, and venture to suggest that it may have had something to do with the damp winter. *Brephos parthenias* appeared more commonly in April, but was much more scarce than last year and much later in appearing, it having appeared on March 10th last year. I am afraid that the former circumstance was partly caused by the persecution which it suffered in 1882, as I heard that a dealer in entomological specimens took a considerable number. I took one *Pachynemias hippocastanaria* at Shirley on April 2nd, and saw one or two on other days at the beginning of the month; and *Lobophora lobulata* appeared on the 8th. At willows nothing appeared, except a very few *Tæniocampa gothica*, *T. stabilis*, *T. instabilis*, and *T. cruda*. I took one *Cymatophora flavicornis* on April 5th, and *Tephrosia biundularia* appeared about the 12th; hibernated specimens of *Cerastis vaccinii*, one *Calocampa exoleta*, and *Eupithecia abbreviata* about the 10th; *Fidonia atomaria*, *Eupithecia nanata*, and *Pachynemias hippocastanaria* (in great abundance) about the 25th. About this time I also saw one *Anticlea badiata* and a few *Selenia illunaria*. I also took, by sweeping at night, large numbers of the larvæ of *Scodonia belgiana*, mixed with those of *Aspilates strigillaria*. *Tephrosia crepuscularia* and *Anarta myrtilli* both appeared on April 30th, and continued on the wing for a long time after. I took *A. myrtilli* in great abundance on Shirley Hills in July. In May appeared at first only the April species, but later on appeared *Panagra petrarum*, *Adela viridella*, *Venilia maculata*, *Melanippe montanata*, *Argynnis euphrosyne*, *Thecla rubi* (one curious specimen of the latter I took with a yellowish white spot on the upper side of the fore wing),

Anthocharis cardamines, *Pyrausta punicealis*, and *P. purpuralis*. *Fidonia piniaria* appeared on the 27th, but it was not till the end of June that it was fully out, and it continued till the middle of July, and was more abundant than I have ever seen it before, especially the females; the larva was very common this autumn. During a visit to Essex, in June, I saw *A. selene* and *Melanippe hastata*. The next day, at West Wickham, a friend of mine took a specimen of *A. selene*, flying with its commoner congener, *A. euphrosyne*, and also a specimen of *Minoa euphorbiata*; this fact is interesting, as neither of these two last-mentioned species occur regularly at West Wickham. During June also appeared the following:—*Hepialus humuli* (2nd of June), *H. lupulinus*, *Lomaspilis marginata*, *Scodonia belgaria*, *Aspilates strigillaria*, *Agrotis porphyrea*, *A. exclamationis*, and a *Noctua* which I think was *A. nigricans*, *Dianthæcia carpophaga*, *D. conspersa*, *Adela degeerella*. During July I took *Ellopia fasciaria*, *Phorodesma bajularia*, *Hemithea thymiaria*, *Hepialus hectus*, *Liparis auriflua*, *L. salicis*, *Pachynemias hippocastanaria* (second brood, I suppose), *Eupithecia minutata*. I found sugar perfectly useless this summer, the best that I took in one night being *Xylophasia polyodon* and *Apamea oculatea*. About the end of this month I took a number of male *Nemotois scabiosella* and three females near Caterham in a grassy meadow. The males were very common, and I took as many as I could box. The females were not fully out, but last year, when I discovered the species in this locality, I took three females and only one male; they were then getting over. I spent a few days, at the end of June, at Reigate, and, although the weather was rather unfavourable, I took a good many things. I noticed, in collecting the cocoons of *Zygæna filipendulæ*, that a great many contained dried-up larvæ, or very small pupæ, which latter died. Can any one suggest why the larvæ should have been starved to death, as that seems to me to be the cause? I took here *Strenia clathrata*, all three species of *Pyrausta*, *Ennychia anguinalis*, *Acidalia imitaria*, saw one *A. ornata* taken, *Eupithecia coronata*, and *Phytometra ænea*. I searched the chalk hills carefully for *Spilodes palealis*, of which I took specimens in 1878, but without success. In the New Forest the scarcity of some species was very apparent; *Limenitis sibylla* and *Argynnis paphia* were scarce and getting over, especially the former; *A. adippe* and *A. aglaia* were

scarce, but fresher; the *Catocalæ* altogether absent; *Arge galathea* fairly common and fine; *Selidosema plumaria*, males very abundant, females only three; *Lycæna ægon*, common, but often worn; *Lithosia quadra*, only one; *Iiparis monacha*, none at all; *Cleora glabraria*, three; *Vanessa polychloros*, one; *Cynthia cardui*, one; *Acidalia inornata* (?), one; *A. bisetata* and *A. aversata*, very common, the only common insects in the evenings; a *Nonagria* or *Leucania*, something like *Bondii*, one; *Eubolia palumbaria*, common; three pupæ of *Nonagria typhæ* and one of *N. fulva* from stems of *Typha latifolia* (I bred one of the *N. typhæ* and the *N. fulva*). At Box Hill, on August 1st, I took *Ilithyia carnella* (fifteen), *Hesperia comma* (just coming out), only one. The day was very hot, and I saw plenty of various common things flying about; the yew trees produced one *Lithosia aureola*, and in Headley Lane I took three *Botys pandalis*. At Ventnor I found *Cynthia cardui*, common; *Vanessa atalanta*; *Lycæna argiolus*, *L. agestis*, *L. adonis*, and *L. corydon*, all common; *Botys flavalis* and *B. asinalis*; *Gnophos obscurata*; *A. citraria*, very abundant; &c. I got eggs from one *A. citraria*; the larvæ emerged after I came to Croydon; they were dull greyish brown, and always rested with their heads curled in. I did not know their food-plant, but I supplied them with various low plants; all died except one, which subsisted for about a fortnight on clover, but never grew, and died at last, as I neglected it for a few days. Returning to Croydon, I found insects very scarce at the beginning of September. The ivy is just coming out, and I hope to take something if the weather is favourable. I have taken, at sugar, *Cymatophora diluta*, *Amphipyra pyramidea*, and *Anchocelis pistacina*. A few days ago an *A. litura* flew into the room, and yesterday I took at sugar *Cerastis vaccinii*, *Phlogophora meticulosa* (very scarce this autumn), and *Xanthia ferruginea*. I have found some insects very common this year, such as *Euchelia jacobææ* and *Sesia tipuliformis*. I took a *Scotosia undulata* this year at West Wickham; as I did not know it occurred there, I was somewhat surprised.—W. M. GELDART; Addiscombe, Croydon, Oct. 14.

NOTES FROM GIBRALTAR. — I read with much interest Capt. Becher's account of his captures at Gibraltar (Entom. xvi. 241). As my experience of the "Rock" is somewhat more extended than Capt. Becher's, perhaps I may be allowed to give a more

complete list of the local Rhopalocera, and to add one or two notes. My list of captures on the Rock itself is as follows:—*Papilio machaon*, *Thais rumina*, *Euchloe belemia*, *E. ausonia*, *E. euphenoides*, *E. tagis*, *Pieris daphidice*, *P. brassicæ*, *P. rapæ*, *Colias edusa* and var. *helice*, *Gonepteryx cleopatra*, *Vanessa atalanta*, *V. cardui*, *Hipparchia fidia*, *Satyrus megæra*, *S. egeria*, *S. janira*, *S. ida*, *Lycæna argiolus*, *L. alexis*, *L. agestis*, *L. bæticus*, *Polyommatus phlæas* and var. *eleus*, *Thestor ballus*, *Thecla rubi*, *T. ilicis*, *Spilothyrus alceæ*, *S. althææ*, and *Hesperia proto*. In addition to these, I have taken the following in the surrounding country:—*Leucophasia sinapis*, *Anthocharis cardamines*, *Gonepteryx rhamni*, *Hipparchia statilinus*, *Satyrus pasiphae*, *Cænonympha dorus*, *Lycæna melanops*, *Thecla roboris*, *T. quercus*, *Hesperia alveæ*, *H. sao*, *H. nostradamus*, *H. actæon*, and *H. lineola*. I have never seen *Pieris napi* nor *Vanessa polychloros*. The male of *Lycæna alexis* has very frequently a marginal row of small black dots on the upper side of the hind wings. Var. *eleus* has frequently a row, more or less indistinct, of purple spots between the base and the marginal copper band on the hind wings, reminding one of the white spots in *termattensis*. The under side of *L. agestis* is of a rich burnt-sienna colour, instead of the usual grayish brown. The hunting season begins about February 18th, when, if the season is fine, *T. rumina* and *E. belemia* begin to appear, followed at the end of the month by *T. rubi*; but April, May, and June are the most profitable months. Almost the last to appear is *H. fidia*, quite at the end of June. Before the middle of July all herbage is burnt to one uniform brown colour, and the chase comes to an end. Some few stragglers (notably *P. nostradamus*) linger on in the greener spots till the end of September, and of course some live through the winter. Heterocera are scarce. Sugaring was an utter failure and attended with difficulties, as the only place available for the purpose is the public garden, which at night bristles with sentries, to whom of course an entomologist fully equipped with lantern, &c., is an object of grave suspicion. The great abundance of ants, too, rendered the sugaring of the trees useless. The mixture was frequently one mass of ants when I visited the trees treated with it. *Macroglossa stellatarum* may be seen all the year round exploring the crevices of the rocks, and often the cracks in the wood-work within doors, with its proboscis. When doing so it is said locally to be looking

for bugs (*C. lectularius*); if this be the case, it must be a very well fed insect. The handsome but sluggish *Saturnia pyri* is not uncommon, and appears in April.—G. S. PARRY; Major, R.A.

LEPIDOPTERA NEAR MAIDENHEAD.—I am very pleased to be able to add to the records of the appearance of *Colias edusa*. I noticed a male of this species in the meadows between Cookham and Maidenhead on Sunday, October 28th. On the same morning, which was very bright and warm considering the lateness of the season, several specimens of *Gonepteryx rhamni*, *Vanessa atalanta*, and *V. cardui* were seen. Common Noctuæ are still coming freely to sugar in my garden, where I took, last month, amongst other things, *Xanthia gilvago* and *Xylina semibrunnea*, both species new to this district. I notice that a correspondent (Entom. xvi. 236) draws attention to the fact of *Hepialus velleda* occurring in the south. It occurs freely, sometimes in great abundance, in a copse near Pinkney's Green, in this neighbourhood; last year it was not so common, on account probably of hard weather at the time of its appearance. *V. cardui* has been abundant all over this district during the past season; I have also noticed that *Lycæna alsus*, which used to be very local, has established colonies in places where it never used to be found. *Argynnis adippe* continues to be as abundant as ever; it is one of the commonest butterflies in many of the woods on the Buckinghamshire side of the river. It is with regret, however, that I have to record the total disappearance of *Macroglossa bombylifformis* and *M. fuciformis*, both of which used to be quite common in the Dropmore Woods; it is now some years since I have seen either, and I greatly fear that they have disappeared in the same way that *Limenitis sybilla* has done from the neighbouring woods of Burnham Beeches and Black Park. Last June I visited, for the first time, the chalk downs at Chinnor, near West Wycombe, and found *Thecla rubi* and *Procris geryon* in abundance; also a few good specimens of *N. plantaginis*. Judging from appearance, I should think the last-named locality ought to make a very fair entomological collecting-ground; it is, however, rather difficult to reach from London.—H. C. LANG; Maidenhead, Berks. Nov. 1, 1883.

VANESSA ATALANTA IN HUNTINGDONSHIRE.—*Vanessa atalanta* was very abundant this year in Huntingdonshire; it has not been

so common since 1879. On Wednesday, the 17th, dozens could be seen flying, although the wind was strong, and the gusts came and blew the insects frequently into the high hedges and some into the grass, so that I could pick them up; they were good specimens. It has been recorded that *Plusia gamma* was extremely common in September, being the second brood. I believe from observations that the later brood is always more numerous than the earlier. Possibly the summer weather is favourable for its better development of the larvæ, &c., and so larger numbers are ensured. Several species of Diptera have been more than usually abundant this autumn on the flowers, chiefly *Compositæ*, in my garden; among them were *Syrphus balteata*, *S. ribesii*, *Eristalis tenax*, *E. nemorum*, *E. similis*, and *Helophilus frutetorum*. *Tipula oleracea* has been quite a pest in some fields near here; it literally swarmed. — HERBERT S. NORRIS; St. Ives, Hunts, October 18, 1883.

ARGYNNIS LATHONIA AT DOVER.—Thinking it not improbable, after last year's "takes," that *A. lathonia* might put in an appearance here this season, I resolved to pay another visit, hoping that I might again take this little rarity; but not a trace of it was to be met with at the localities of either last or former years, although numerous collectors were from time to time on the ground, and we were favoured with some really magnificent weather. I am, however, pleased to record several captures at a spot some distance removed from last season's by Mr. Bayley, one of the collectors who was successful in 1880. Mr. Bayley informed me one day that he had seen *A. lathonia*, but, having no net with him at the time, was consequently unable to secure it. He kindly directed me where to go, but I unfortunately misunderstood him, and spent two or three more days searching in vain; and when next I saw him I heard that he had taken four, two on the 14th inst. and two on the 15th, one, a female, having large and somewhat confluent spots on the fore wings, giving the insect rather a striking appearance. When I did succeed in finding the place the weather had changed, and we were seldom favoured by the sun, whose shine had heretofore been so constant, and although I saw one *A. lathonia* I was unable to overtake or capture it. Most provokingly (for me) the sunny intervals generally occurred when I was absent some distance from the ground, and by the time of my return the sky

had again become overcast. Mr. Bayley, however, living close by, was able to take almost immediate advantage of such moments, and was rewarded by taking one on the 21st, and two (*in copulâ* on a thistle) on the 22nd, all of which he handed me alive. After my return home, Mr. Bayley wrote me that on the 28th three more, two of which were wretched dilapidated specimens, were taken by R. Gillham, and one by himself on the 29th, also much worn. These are all I have heard of as being taken at Dover this season, and I may add that I was informed by Mr. Gray that a specimen was seen last year at or near the place that has proved the present headquarters of the species.—E. SABINE; 17, The Villas, Erith, Sept., 1883.

COLIAS EDUSA IN DEVONSHIRE.—As several notices of *Colias edusa* have appeared in the 'Entomologist,' I may perhaps record the appearance of a single specimen, which I saw flying round a cliff at Dawlish, Devon, on August 28th.—W. W. FOWLER; Lincoln, November 7, 1883.

SPHINX CONVULVULI AT WALTHAMSTOW.—I had the pleasure of taking on September 19th last, after three weeks' watching, an example of the above-named insect. It was flying rapidly round a bed of Marvel of Peru.—H. JOBSON, sen.; Walthamstow.

SPHINX CONVULVULI, &c.—On the 2nd of last month I had a fine specimen of this insect brought to me, but in a very battered condition, owing to its having been taken by inexperienced hands. I have not seen this *Sphinx* since 1872, when I received several, one of which was taken at the top of a scaffold-pole. With reference to the duration of the pupal stage of *Smerinthus populi*, I may add that I bred, at the beginning of August, ten specimens from eggs deposited in May: the larvæ underwent pupation at the beginning of July. Having lately returned from Belgium, I may mention that during September insects were very scarce there; the only Lepidoptera I noticed worth mentioning were ten specimens of *Colias edusa*. Larvæ were also far from common, with the exception of one species, which swarmed on the sand-hills at Scheveningen (Holland), and strongly resembled *Eriogaster lanestris*. I therefore conclude that the dearth of insects during the past season has not been confined to this country alone.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury.

DEILEPHILA LIVORNICA IN SUSSEX.—Having seen that several captures of the above-named insect have been recorded in the 'Entomologist' during the last two months, I think it may interest the readers of that magazine to know that I took a very fine specimen on June 29th last, sitting on a truss of straw in a field.—W. H. BLABER; Beckworth, Lindfield, Sussex, Oct. 31st.

THE DISTRIBUTION OF ABRAXAS ULMATA.—This species is by no means rare in Cheshire, but is very local: here it is found on the borders of Dunham Park, and in various places on the banks of the Bollin. In Derbyshire, however, it is exceedingly abundant in Lathliell-dale and Cressbrook-dale. I have seen it by hundreds on the grass in the daytime in Lathliell-dale; the specimens are usually of a pretty light form. In Cressbrook-dale they are generally dark, some being very beautiful varieties. You may quietly walk among them and select what you like as they rest on the grass.—JOSEPH SIDEBOTHAM; Bowdon, Nov. 6, 1883.

ENNOMOS AUTUMNARIA AT DOVER.—Possibly after the extensive breeding of this species by Messrs. Tugwell and Harbour, it is hardly worth while to chronicle captures. I may, however, just state that Mr. Davis, of Dover, has taken several specimens there this season, and hopes to breed the insect [next year, having a goodly number of eggs, deposited by two females.—E. SABINE; 17, The Villas, Erith, September, 1883.

ABUNDANCE OF HEMEROBIUS, AND GENERAL NOTES. — At the suggestion of Mr. McRae (Entom. xvi. 235) I write to say that I have noticed a very large number of the above-mentioned insects in this neighbourhood during the present year, and also that rose-trees have been much freer from Aphides than usual. With regard to Lepidoptera, the season has, in my experience, been again characterised by a remarkable scarcity of nearly all the usual species, with a few exceptions, notably that of *Vanessa cardui*, which I saw in large numbers on the South Devon coast during August, and *Argynnis paphia* and *Arge galathea* were also plentiful in the same locality; but, besides these three species, I observed very few insects in any number. On August 6th, during a few hours' collecting round Kemsing, near Sevenoaks, very few Lepidoptera were on the wing, such Diurni as *Lycæna corydon* and *Arge galathea*, which usually swarm in that locality, being very

sparsely represented; the only insect I saw during the day which was worth taking was a fine specimen of *Eremobia ochroleuca*, which I found in the chalk-pit. In the neighbourhood of Bromley sugar has been as fruitless as it was last year; and Geometræ have not been nearly so abundant as usual, the only exception being *Phorodesma bajularia*, of which I took a considerable number. Among the Noctuæ, *Brephos parthenias* was abundant at the end of March and beginning of April, but this, with the exception of the ubiquitous *Noctua xanthographa* and *Plusia gamma*, was the only representative of that large family which I saw in any abundance. Of *Triphæna pronuba* I do not think I saw half a dozen specimens throughout the season, and of *T. orbona* I do not recollect one. While sugaring at West Wickham one evening in July, I observed *Hepialus hectus* flying over the tops of the grass in large numbers, and a few Geometræ were on the wing; but the solitary visitor to the sweets was one specimen of *Rusina tenebrosa*, and near this town I have diligently worked a good round of trees with very little better success. On the whole I have found the season considerably worse than the last in every respect; many species which I took then appeared in considerably diminished numbers this year, and many have not put in an appearance at all.—P. WATCHURST; Hope Park, Bromley, Kent, October 1, 1883.

DIPTEROUS MINER IN THE LEAF OF THE GROUND IVY.—Early in September I gathered a few leaves of the ground ivy (*Glechoma*) that gave evidence of the work of some dipterous miners. They were put into a glass-topped box, and occasionally sprinkled with water to keep them moist. The larvæ must have been nearly full-fed, for in a few days I found half a dozen pupæ in their brown cases adhering to the bottom of the box. The tenant of one of these put on wings on September 27th, and has proved to be the *Phytomyza glechomæ* of Kaltenbach, possibly new to Britain. Kaltenbach says of it:—"The larva lives in two generations,—from May to June, and from August to September. The galleries which it forms extend at first along the edge of the leaf, widening materially as the grub attains maturity." The tunnel, indeed, which is pale and conspicuous, slightly reminds you of a wreath of steam. Kaltenbach says, in relation to the imago:—"Fly dull black, poisers whitish, legs uniformly black; the ordinary cross-vein does not exactly coincide with the smaller

one, but lies somewhat further removed from the base of the wing. In other respects the fly resembles Macquart's *Phytomyza nigricans*." I have only reared one; the others, doubtless, will remain in pupahood till May of next year.—PETER INCHBALD; Fulwith Grange, Harrogate, November 10, 1883.

WATER-BEETLES GUIDED TO WATER BY SIGHT, AND NOT BY OTHER SENSES.—It is a well-known fact that the water-beetles are often found on greenhouses and hotbed-frames, which they evidently mistake for water. I have never taken *Dytiscus marginalis* in this way, as Mr. McDonald has done (Entom. xvi. 263); but I have found small *Hydropori* on my frames. The habit is noted by Professor Westwood in his 'Introduction to the Modern Classification of Insects' (1840), where he says (vol. i., p. 103):—" *Acilus sulcatus* is another species which possesses the power of making a noise. Frisch states that this is produced under water; but a specimen of the insect which I kept some time (and which I had caught on the ground, having fallen whilst flying upon some glass-panes, which it had evidently mistaken for water) was equally noisy when confined in a box in the sunshine."—W. W. FOWLER; Lincoln, November 7, 1883.

WATER-BEETLES AND LIGHT REFLECTED BY GLASS.—I have also, like your correspondent Mr. McDonald (Entom. xvi. 263), noticed that water-beetles are often misled by glass, as I have found on my frames the large beetles *Hydrophilus piceus*, as well as smaller ones, evidently denizens of the water by their shape; indeed I have heard them knock against the glass on fine nights, probably travelling between the ponds with which this part abounds. This travelling habit of water-beetles may perhaps afford some elucidation to the question so often asked as to how new ponds, far removed from old ones and having no connection, become tenanted with fish and eels, as it seems quite within the bounds of possibility that the beetles may carry the spawn attached to their bodies —J. FROST; Headcorn, Kent, Nov. 13.

WEST LONDON ENTOMOLOGICAL SOCIETY POCKET-BOX EXHIBITION.—An exhibition of British insects took place on the evening of November 16th, in this society's room, St. Mark's Institute, George Street, Oxford Street. Although called a pocket-box exhibition, many of the exhibitors had very properly

not confined themselves to the small space obtainable in such receptacles, but showed their exhibits in cabinet drawers or large glazed cases; among these may be mentioned Mr. Southey's interesting collection of Lepidoptera captured in the north of London during the year now drawing to a close. Mr. Gee also exhibited a case of Lepidoptera taken this year in the Highgate district, among which were some very nice aberrant forms of *Abraxas grossulariata*; one especially rich form had been captured while at rest on a wall. Two cases of carefully-preserved larvæ were shown by Mr. C. H. Williams; also imagines of *Stauropus fagi*, *Heliothis peltigera*, *Acidalia contiguaria*, &c. Mr. Dow's exhibit comprised *Eupæcilia subroseana*, *Chrosis rutilana*, *Cochylis dipoltana*, and other interesting Tortrices; and the boxes of Mr. Boden contained a very fine lot of Crambites and Tortrices, about twenty-five species in all, the most noteworthy being *Crambus latistriellus*, *C. hamellus*, *Cryptoblates bistrigella*, *Phycis abietella*, *Mixodia rubiginosana*, *Coccyx pygmæana*, *Chrosis bifasciana*, Hub. (= *audouinana*, Dup.), and some bred *Coleophora inflatella*; also two insects, about the identification of which there seems to be some diversity of opinion; one of these would appear to be an exaggerated example of *Catoptria ulicetana*, and the other possibly a very pretty form of *Sericoris cespitana*. Mr. Burrey showed, among other insects, examples of *Notodonta trepida*, and three specimens of *Fidonia piniaria*, two of which were slightly different from the normal form, but the third example was a very striking aberration; also a fine series of *Crymodes exulis*; these latter were exhibited on behalf of Mr. G. Clark, of Rannoch. Mr. Gates and Mr. Stevens both showed varieties of *Chelonia caja*, together with other insects; and Messrs. Riches, Knight, and Whiman each exhibited several interesting specimens captured this year. In my own box I had varieties of *Polyommatus phlæas*, and a specimen of *Vanessa urticæ* in which the two usual smaller black spots on anterior wings are reduced almost to vanishing point. — F. GODWIN; Hon. Sec.

SOUTH LONDON ENTOMOLOGICAL SOCIETY. — A special pocket-box exhibition was held on Thursday, October 25th, 1883, at the Society's rooms, 94, New Kent Road, S.E. The Vice-President, Mr. W. West, occupied the chair in the absence of the President, Mr. J. R. Wellman, who was unable to attend through illness.

Twenty-one boxes were shown, and comprised the following :—Mr. W. A. Pearce, *Aspilates gilvaria*, *Eubolia mensuraria*, and *Anaitis plagiata*. Mr. W. West, *Ligdia adustata*, *Acidalia emutaria*, *Melanippe procellata*, and *Ephyra omicronaria*. Mr. South, *Boarmia repandata*, *B. consortaria*, *Pyralis fimbrialis*, variety of *Lycæna adonis*, male variety of *L. corydon*, male variety of *L. alexis*, three varieties of *Hadena rectilinea*, *Dianthœcia carpophaga*, and variety of *Aspilates citraria*. Mr. Adkin, *Nola centonalis*. Mr. Oldham, *Chelonia caja*, *Argynnis paphia*, *Acronycta psi*, *A. megacephala*, *Arge galathea*, *Miselia oxyacanthæ*, and *Apamea ophiogramma*. Mr. H. L. Bolger, *Dicranura vinula*. Mr. Chaney, a small collection of Coleoptera. Mr. T. R. Billups exhibited seven boxes, as follows :—Box 1, fifty species of Ichneumonidæ, taken at Sevenoaks and Headley Lane, June, 1883, several being of great rarity. Box 2, sixty species of Diptera, taken in 1883. Box 3, twenty-five species of Hymenoptera Aculeata, most of them being bees, taken at Margate, August 1st, 1883. Box 4 contained specimens of galls of *Cynips kollari* and the maker; also forty-two species of Parasites and Inquilines, reared from the same galls. Box 5, thirty-nine species of Hydradecephaga, or water-beetles, from West Ham and Loughton. Box 6, fifteen species of rare Coleoptera taken during the season. Box 7, larva, pupa, and imago of *Tephritis onopordonis*, or celery-fly, which has done vast damage this year to the celery crops.—W. H. MILES, Hon. Sec.



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“ By mutual confidence and mutual aid
Great deeds are done and great discoveries made.”
POPE'S ‘*Homer*.’

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1884.

"In nomenclature, it is a sound plan to revert to some standard authority; and, supposing that described and named objects be at any subsequent time re-described and named as new, to strike out such new names as soon as the fact shall be pointed out, and substitute the old names in their right of priority: in all instances subsequent to such authority, the best rule is, that the name first published be received."

EDWARD NEWMAN in '*Grammar of Entomology.*'

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- ADKIN, ROBERT, 142
ALFORD, B., 233
ANDERSON, E., 239, 281
ANDERSON, JOSEPH, jun., 254, 275
ANDERSON, R. J., 251
ARCHER, HAROLD, 91, 110
ATMORE, EDWARD A., 33, 93, 95, 250, 254, 273

BALDING, GEORGE, 256
BARCLAY, F. H., 141
BATH, W. HARCOURT, 141, 142, 272
BECHER, Rev. WILLIAM, 74
BIGNELL, G. C., 46, 114, 167, 183, 190, 208, 259
BIRD, GEORGE W., 210
BISHOP, E. B., 41
BISSHOPP, E. F., 237
BLABER, W. H., 232
BOUTTELL, C. S., 65
BRADY, WM. E., 111
BRIDGMAN, J. B., F.L.S., 69, 121, 176, 223
BRIGGS, CHARLES A., 18, 197, 208
BROOKS, W., 233
BUCKELL, EDWARD, 67
BULL, H. E. U., 46
BURNAY, Rev. HENRY, M.A., 232
BURRY, R. G., 23

CAMBRIDGE, A. W. P., 250
CAMBRIDGE, Rev. O. P., F.L.S., 143, 265
CAMPBELL, W. HOWARD, 59
CAPRON, EDWARD, M.D., 46, 221
CARRINGTON, JOHN T., F.L.S., 24, 40, 47, 67, 72, 88, 96, 116, 119, 144, 145, 192, 208, 240, 261, 262, 263, 264
CHRISTY, ROBERT MILLER, 81
CLARK, J. A., M.P.S., 250, 252
CLIFFORD, J. R. S., 108, 164, 167
CLISSOLD, J. M., 65
COCKERELL, T. D., 272
COOKE, B., jun., 252
COOKE, N., 258
COOPER, J. A., 251, 252
CORBETT, H. H., 91, 120
COVERDALE, GEORGE, 131, 184, 185, 204
CROSS, ELIZABETH, 236
CURZON, EDWIN ROPER, 210

DALTRY, Rev. THOS. W., M.A., F.L.S., 270
DECIE, Miss PRESCOTT, 115
DISTANT, W. L., 191
DOBREE, N. F., 107
DOBSON, H. T., jun., 94, 250
DRUITT, A., 94, 250
DUNNING, J. W., M.A., F.L.S., 212

EARL, H. L., 96
ELISHA, GEORGE, 201, 235

FANSHAWE, LYONELL, 141
FARN, A. B., 210
FITCH, EDWARD A., F.L.S., 47, 67, 117, 121, 176, 190, 212, 223, 274, 277, 287
FLEMING, Rev. W. W., M.A., 19
FLETCHER, J. E., 21, 22
FOWLER, Rev. W. W., M.A., F.L.S., 54, 156, 188
FROHAWK, FRED. W., 37, 49, 63, 73
FRY, CLARENCE E., 71

GRAPES, GEO. J., 42
GREENE, Rev. JOSEPH, M.A., 129
GREGGSON, C. S., 230
GUTCH, EDWARD LEWER, 183

HALL, A. E., 209
HALL, C. G., 65
HALL, T. W., 89
HARBOTTLE, A., 168
HARBOUR, R., 272, 273
HARDING, MARTIN J., 182, 185
HARKER, GEO. A., 253
HARRISON, J., 111
HART, THOMAS H., 260
HAWES, F. W., 273
HILL, LEWIS F., 252
HINCHCLIFF, Miss, 271
HODGKINSON, J. B., 20, 165, 166, 184, 185, 274, 281
HORNER, A. C., 238
HUDSON, GEORGE VERNON, 169
HUNT, B. B., 251, 273
HUTCHINSON, R. J., 232

INCE, CHAS. E. M., 41

JEFFERYS, T. B., 183, 273

- JONES, A. H., 228
- KANE, W. F. DE V., M.A., M.R.I.A., 14,
25, 97
- KINGSFORD, CLARA, 17
- LANG, H. C., M.D., F.L.S., 206, 232
- LEECH, J. H., 133
- LEWCOCK, G. A., 20, 172
- MACHIN, WILLIAM, 87, 166, 212, 281
- MACMILLAN, W., 144
- MANSFIELD, M. J., 271
- MARSH, HENRY, 16
- MARSHALL, ARTHUR, 209
- MATHEW, GERVASE F., R.N., F.L.S.,
F.Z.S., 217, 247, 266
- MCARTHUR, H., 275
- MCRÆ, W., 43
- MEEK, E. G., 253, 278
- MELDOLA, R., F.C.S., &c., 253
- MELVILL, J. COSMO, M.A., F.L.S., 253
- MORRIS, C. H., 166
- NORRIS, HERBERT E., 40, 64, 95, 187
- PEARCE, WALTER A., 168
- PEARCE, W. T., 234
- PENRUDDOCKE, G. H., 182
- PERKINS, V. R., 44
- POOL, W. B., L.R.C.P., 233
- PORRITT, G. T., F.L.S., 18, 44, 111,
143
- RAYNOR, REV. GILBERT HENRY, 39, 251
- REDCLYFFE, J. N. KENWARD, 280
- RENDALL, PERCY, 92, 261, 275
- RUSS, PERCY H., 143
- SABINE, E., 271
- ST. JOHN, REV. J. SEYMOUR, 11, 107, 257
- SETON, BRUCE G., 140
- SHEPHERD, A. H., 136
- SHUTTLEWORTH, EDMUND, 4
- SICH, ALFRED, 42
- SIDEBOTHAM, JOSEPH, J.P., F.L.S., &c., 52
- SLADE, W., 252
- SLADEN, REV. C. A., M.A., 42
- SMITH, G. D., 17
- SNELL, C. DASHWOOD, 16
- SOUTH, RICHARD, 241, 259
- SPILLER, A. J., 62, 96
- TARBAT, J. E., 139
- TAWELL, J. A., 261
- THORNEWILL, REV. CHAS. F., M.A., 35
- THRELFALL, J. H., 113
- THURNALL, ALFRED, 165
- TRIMEN, ROLAND, F.R.S., &c., 269
- TRISTRAM, W., 19
- TUGWELL, W. H., 111, 153, 183, 235
- TUTT, J. W., 142, 234, 271
- WAILLY, ALFRED, 28, 103
- WALDEGRAVE, EARL, 274
- WALPOLE, THOMAS, 43
- WATCHURST, P., 278
- WATERS, ALBERT H., 16, 92, 164
- WATSON, ROBERT M., 252
- WEBSDALE, G. R., 236
- WEIR, J. JENNER, F.L.S., F.Z.S., 1, 39,
50, 120, 193, 270
- WEST, W., 253
- WILDES, G. F. G., 141
- WORMALD, S., 184
- WRIGHT, W. H., 108, 186, 283
- WRIGHT, W. T., 8

ALPHABETICAL LIST OF SUBJECTS.

- Abnormal emergence of *Chelonia caja*,
65; of *Noctua augur*, 65
- Abnormities in Lepidoptera, 16
- Acherontia atropos*, 17; in the centre of
Liverpool, 252; at Earls Colne,
261; at Deal, 273; in Lancashire,
274
- Acronycta alni*, 141, 209, 252; pisi,
curious habit in larva, 252; rumi-
cis, 92
- Actias atlas*, 104; luna, 29; selene, 103
- Agriotypidæ*, 121
- Agriotypus*, 121
- Agrotis cursoria*, 3; *lucernea*, 3; por-
phyrea, 3; *segetum*, abnormal
abundance, 254
- Anomalon*, 23
- Antheræa mylitta*, 104; *Roylei-Pernyi*,
hybrid, 103
- Apatura clyton*, 30; iris near Salisbury,
182
- Aphis*, New Zealand, notes on, 169
- Aplecta occulta*, 3
- Argynnis aphirape var. tricularis*, 51;
aphrodite, 50; *lathonia* near Salis-
bury, 182; near Canterbury, 208;
near Ashford, 232
- Attacus cynthia*, 103; luna, rearing, 42
- Bassus lætatorius* bred from a *Syrphus*
cocoon, 167
- Beetle, blue, in Essex, 212; willow, at
Lymm, 239
- Beetles, carnivorous, vegetable feeders,
260
- BERKSHIRE:—
Chærocampa celerio in, 252; *nerii* in
Dorsetshire, 275

Birds *versus* insects, 95; in relation to Lepidoptera, 37

Birmingham Naturalists' Field Club, 144

Blatta americana, 95

Boletobia fuliginaria, notes on, with description of larva, 153; rearing, 183

BOOKS REVIEWED:—

'British Lepidoptera, "The Entomologist" Synonymic List of,' by Richard South, 212

'Butterflies of Europe,' by H. C. Lang, M.D., F.L.S., 72, 284

'Butterflies of Maine, by C. H. Fernald, A.M., 263

'Catalogue of British of Hymenoptera (Aculeata),' by Edward Saunders, F.L.S., 47

'List of Yorkshire Lepidoptera,' by George T. Porritt, F.L.S., 116

'Report on the Tea-mite and the Tea-bug of Assam,' by J. Wood-Mason, 192

'Rhopalocera Europæ descripta et delineata: The Butterflies of Europe described and figured,' by Henry C. Lang, M.D., F.L.S., 72, 284

'Scientific Nomenclature,' Remarks on, by C. S. Gregson, 264

'Seventh Annual Report of the Lancashire and Cheshire Entomological Society,' 117

'Third Report of the United States Entomological Commission, 262

'Transactions of the Huddersfield Naturalists' Society,' 117

Bournemouth Society of Natural Science, 24

Butterflies, British, 272; European, Tourists' Handbook of, 96

Callimorpha hera in Devonshire, 233

CAMBRIDGESHIRE:—

A Bank holiday in 1883 amongst Lepidoptera in, 91; Cambridge, Lepidoptera at, 16, Noctua near, 92; Lepidoptera in the Fens, 210

Campptogramma bilineata, 3; *fluviata* at Bournemouth, 111

Captures in August, 272

Carnivorous beetles vegetable feeders, 260

Ceratocampa (Eacles) *imperialis*, 29

Cercyon, the genus, 54

Charexas graminis, 253

Charaxes, new species of from the Malay Peninsula, description, 191

Chelonia caja, abnormal emergence, 65

CHESHIRE:—

Lymm, Willow Beetle at, 239

Cherocampa celerio in Berkshire, 252; *nerii* at Eastbourne, 233; at Tottenham, 233

Cidaria immanata, 3

Cœlixys elongata emerging from a cocoon, 190

Cœnonympa tiphon var. inornata, 50

Coleophora maritimella, 185; (n. s.), 87; *potentilla*, 281; *vibicigerella* (n. s.), 87

Coleoptera in 1883, 20; our native, 168; captures, 172; at Shiere, 221

Colias edusa, 41, 270; in Switzerland, 41; at Haslemere, 232; in Sussex, 232; at Christchurch, 250; in Hackney, 250; in Kent and Essex, 251; at Dover, 251; near Maldon, 251; at the Land's End, 251; in North Staffordshire, 270; in Kent, 270; at Folkestone and Dover, 271; in Dorsetshire, 271

Collecting near Manchester, 96; in Sicily, a fortnight's, 133; in Unst, a week's, 197; near Charmouth, 210; at Lynmouth, N. Devon, 241; in Suffolk, 278

CORNWALL:—

Land's End, *Colias edusa* at, 251

Cossus ligniperda in Ireland, 19

Crabro varius, 46

Crymodes exulis in Unst, 210

Cryptopleurum atomarium, 59

Cucullia scrophulariæ two years in pupa, 143, 165; and *C. verbasci* larvæ, 183

Darapsa myron, 32

Dasyampa rubiginea in Somerset, 107

Dasyptolia templi, 3

Death-watch, 144; and its sound, 167, 188, 236, 237

Deilephila lineata at Brighton, 252; at Sandwich, 272

Deiopeia pulchella, 141, 183

Deltoid, new British (with figure), 265

DEVONSHIRE:—

Season at Ilfracombe, 16; *Callimorpha hera* in, 233; collecting at Lynmouth, 241; *Laphygma exigua* in North, 253; *Vanessa atalanta*, V. cardui, and *Plusia gamma* in North, 271

DORSETSHIRE:—

Charmouth, collecting near, 210

Chærocampa nerii in, 275

Gonepteryx rhamni in, 271

Dianthœcia conspersa, 3

Diptera, British, study of, 115

Diurni, localities of, 40

Dryocampa (*Anisota*) *rubicunda*, 30

Eacles (*Ceratocampa*) *imperialis*, 29

Elachista densicornella and other captures, 185

Emergence, irregular, of Lepidoptera, 39, 94; retarded, 108, 164

Emmelesia albulata var. thules, 3; *nanata* (?), 3; *venosata*, 3

- Entomological evenings at the Royal Aquarium, 22; jottings from Chichester, 254
- Entomological Society, Haggerston, 23, 239, 281; South London, 168, 283
- 'Entomologist' Synonymic List of British Lepidoptera and the Haggerston Entomological Society, 239, 261
- Entomology in South London,—a good season, 89
- Ephestia ficulella* and *E. passulella*, importation to King's Lynn, 93
- Epione advenaria*, early appearance, 92
- Epunda lutulenta* and its varieties, 14, 107, 143; *nigra* at Bournemouth, 43; in Perthshire, 236
- Eriogaster lanestris*, pupation, 142
- ESSEX:—
- Blue beetle in, 212
- Colias edusa* in, 251; at Maldon, 251
- Earls Colne, *Acherontia atropos* at, 261
- Eupithecia*, new to Science, description, 230; *nanata*, var. *curzoni*, 276
- Exapete gelatella*, abundance, 44; in Surrey, 94
- Exochilum*, 181
- Exotic Lepidoptera reared in 1883, 28, 102
- Food of *Gonepteryx rhamni*, 42, 91
- Geometra smaragdaria*, larva, 235
- Gonepteryx rhamni*, food, 42, 91; in Dorsetshire, 271
- Grapholita cæcana*, &c., on the S.E. coast, 184
- Grapta comma*, 51
- Gravenhorstia*, 227
- Gymnancycla canella*, description of larva, 111
- Hadena exulis*, 2
- Haggerston Entomological Society, 23, 239, 281
- HAMPSHIRE:—
- Bournemouth, *Epunda nigra* at, 43; *Camptogramma fluviata* at, 111
- Christchurch, *Colias edusa* at, 250
- Laphygma exigua* near Basingstoke, 261
- Lepidoptera near Portsmouth, 234
- Harper's Lepidoptera, sale of Dr., 88
- Hemaris tenuis*, 30
- Hemerobius*? or *Chrysopa*? 22, 46
- Henicospilus*, 176
- Hepialus humuli* var. *hethlandica*, 2; *velleda*, 2
- Heteropelma*, 182
- Heteropterus mandan*, 51
- Homœosoma nebulella*, description of larva, 143
- Hudson's Bay, *Rhopalocera* of, 50
- HUNTINGDONSHIRE:—
- Diurni, 64
- Hybernating Lepidoptera, effect of artificial heat on, 110
- Hybernia progemma* var. *fuscata*, 111, 142
- Hydrochus*, *Octhebius*, and *Hydrana*, genera, 156
- Hymenopterous parasites of Lepidoptera, 67
- Hypena obsitalis*, 265
- Hyperchiria io*, 29
- Ichneumon*, new British, 46
- Ichneumonidæ*, introductory papers on (plate), 121, 176, 223
- Ichneumons* and their hosts, 69
- Insects when visiting flowers, methodic habits, 81; affecting stored rice, 167; influence of civilisation upon, 187
- IRELAND:—
- Cossus ligniperda* in, 69
- Derry and Donegal, notes on the past season in, 59
- Nyssia zonaria* in, 61
- Junonia*, description of a new species of, 206
- KENT:—
- Acherontia atropos* at Deal, 273
- Colias edusa* in, 251; at Dover, 251
- Laphygma exigua* near Greenwich, 234, 235; at Deal, 273
- Noctue near Bromley in 1884, 278
- Pieris daplidice* and *Argynnis lathonia* near Ashford, 232; *A. lathonia* near Canterbury, 208
- LANCASHIRE:—
- Acherontia atropos* in centre of Liverpool, 252
- Laphygma exigua* in, 274
- Witherslack, notes from, 4, 165
- Laphygma exigua*, 67, 273; near Greenwich, 234, 235; at Crosby, 253; in North Devon, 253; near Basingstoke, 261; at Deal, 273; and *L. frugiperda*, 274
- Larva of *Gymnancycla canella*, description, 111; of *Homœosoma nebulella*, description, 143; of *Boletobia fuliginaria*, description, 155; of *Geometra smaragdaria*, 235; of *Acronycta psi*, curious habit of, 252
- Larvæ of *Polyphemus*, 29; of *Tæniocampa opima*, rearing, 43, 65; of British Macro-Lepidoptera, 114; of *Cucullia scrophulariæ* and *C. verbasci*, 183; of *Leioptilus microdactylus*, habits of, 259
- LEICESTERSHIRE:—
- Leicester, *Sesia bembeciformis* at, 19

- Leioptilus microdactylus*, 259; habits of larvæ, 259
- Lepidoptera* at Nottingham, 8; at Cambridge, 16; abnormalities in, 16; influence of meteorological conditions upon, 25; exotic, reared in 1883, notes on, 28, 103; at Abbot's Wood and Eastbourne, 35; birds in relation to, 37; irregular emergence, 39, 94; early spring, 67; hymenopterous parasites, 67; the late Dr. Harper's, sale of, 88; in Cambridgeshire, in 1883, a Bank holiday amongst, 91; European variation of, 97; of London suburbs, 108, 186; retarded emergence, 108, 164; nocturnal, colour preferences in, 109; hibernating, effect of artificial heat upon, 110; setting unpinned, 131; of the South-east Coast, contributions to a list of the, 136; near London, 139; local list of, 144; influence of mild winter on, 164; reared in captivity, 201; in the Fens, 210; New Zealand, random notes on, 217, 247, 266; near Portsmouth, 234; effect of the hot summer on, 280
- Lepidopterous* pigments, action of ammonia upon some, 204
- Limenitis disippus*, 32
- Liparis chrysorrhœa*, urticating properties of the hairs of, 256, 275
- Lycæna argiolus* in N. Warwickshire, 141; variety, 41; compared with the American *L. pseudargiolus*, 193, 232; *L. arion*, 208; *L. phlæas* var. *americana*, 50
- Macrogaster arundinis* at Sutton, Surrey, 184; *stellatarum*, late occurrence, 273
- Macro-Lepidoptera of Unst (coloured plate), 1; British, larvæ, 114
- Maniola* (*Erebia*) *discoidalis*, 51
- Megasternum boletophagum*, 59
- Melanippe montanata*, 3
- Melitæa artemis* in Shropshire, 182
- Meteorological conditions, influence of, on Lepidoptera, 25
- Micro-Lepidoptera, notes on some reared in captivity, 201; abundance of, 212
- Micromelus pyrrhogaster*, 46
- MIDDLESEX:—
- Colias edusa* in Hackney, 250
- London suburbs, Lepidoptera of, 108, 186; collecting in south of, 1883, 63; Entomology in south of, a good season, 89; Lepidoptera near, 139
- Minehead Valley, a voice from the, 11
- Moth, a congregating, remarkable nest, 92
- Nepticula centifoliella*, 166; new to Science, 281
- New Zealand, note on *Aphis* in, 169; random notes on Lepidoptera in, 217, 247, 266
- Nisoniades brizo*, 51
- Noctua augur*, abnormal emergence, 65; *festiva*, 2; *glareosa*, 2; *xanthographa*, 2, 42
- Noctuæ* near Cambridge, 92; near Bromley, 278
- Nocturnal Lepidoptera, colour preferences in, 109
- Nomenclature, paronymic, 94; scientific, 18
- NORFOLK:—
- Captures in West, 33; King's Lynn, *Vanessa antiopa*, 250; *Ephestia ficulella* and *E. passulella*, 93
- Notes from Witherslack, 4, 165; on exotic Lepidoptera reared in 1883; 28, 103; on the past season, with captures in West Norfolk, 33; on Lepidoptera-Rhopalocera of Hudson's Bay, 50; on the past season in Cos. Derry and Donegal, 59; on certain *Tinea*, 113; on *Boletobia fuliginaria*, with description of larva, 153; on a New Zealand *Aphis*, 169; on some Lepidoptera reared in captivity, 201; random, on New Zealand Lepidoptera, 217, 247, 266
- Notodonta trilophus* at Southwold, 253
- Nototrachys*, 180
- NOTTINGHAMSHIRE:—
- Lepidoptera* at Nottingham, 8
- Nyssia zonaria* in Ireland, 61
- OBITUARY:—
- Buckler, William, 47
- Förster, Arnold, 287
- Harper, Alfred, 264
- Prest, William, 119
- Saunders, Sir Sidney Smith, Knt., C.M.G., 117
- Oethebius*, *Hydrochus*, and *Hydræna*, genera, 156
- Ceophora woodiella*, the story of, 52
- Cœneis jutta*, 51
- Ophion*, 178
- Ophionidæ*, 122
- Orgyia leucostigma*, 30
- Pachnobia hyperborea*, 3
- Pamphila peckius*, 51
- Papilio machaon* in Surrey, 140
- Parasites, hymenopterous, of Lepidoptera, 67
- Peronea comparana* (read *comariana*) double-brooded, 20, 184
- Petasia nubeculosa* three years in pupa, 111; retarded emergence, 142
- Physianthus albens*, an insectivorous plant, 71

- Pieris brassicæ* var., 141; daplidice at Dover, 208; near Ashford, 232; protodice, 51; rapæ, 50; spilleri, new to Science, description, 62
Plusia gamma in North Devon, 271
Polyommatus phlæas bred, 252
Polyphemus, larvæ, reared on oak trees, 29
Psyche reticella, 166
Pterostichus melanarius a fructivorous insect, 238
Ptilium affine, 166
Pupa of *Sphinx convolvuli*, 273
Pupation of *Eriogaster lanestris*, 142
Pyrameis huntera, reported capture, 141

Rannoch (with map), 145; in June, 228
Retarded emergence of *Lepidoptera*, 108, 164
Rhopalocera of Carlsbad, 74; of Hudson's Bay, 50

Saturnia carpini (fig.), 73
Schizoloma, 180
SCOTLAND :—
Epunda nigra in Perthshire, 236
Rannoch (with map), 145; in June, 228
Season at Ilfracombe, 16; notes on the past, 33; in Cos. Derry and Donegal, 59; lateness of, 185; the present peculiarities of, 257; South London, 89
Sericoris irriguana, 258
Sesia bembeciformis at Leicester, 19; *myopæformis*, wasp capturing, 190
Setting *Lepidoptera*, unpinned, 131
SHETLAND ISLES :—
Macro-lepidoptera of Unst (coloured plate), 1; Unst, a week's collecting in, 197; *Crymodes exulis* in, 210
SHROPSHIRE :—
Church Stretton, *Melitæa artemis*, 182
Smerinthus populi, second brood of, 209
SOMERSET :—
Dasycampa rubiginea in, 107
Minehead Valley, 11
South-East Coast, contributions to a list of *Lepidoptera* of, 136
South London Entomological Society, 168, 283
Sphinx convolvuli, pupa, 273

SURREY :—
Colias edusa at Haslemere, 232
Exapata gelatella in, 94
Vanessa antiopa at New Malden, 250
Papilio machaon in, 140
Macrogaster arundinis at Sutton, 184
SUFFOLK :—
Collecting in, 278
SUSSEX :—
Brighton, *Deilephila lineata* at, 252
Colias edusa in, 232
Eastbourne, *Chærocampa nerii* at, 233; *Lepidoptera* at, 35
Lepidoptera-Rhopalocera, 39
Jottings from Chichester, 254
Syrphus cocoon, *Brassus lätatorius* bred from, 167

Tæniocampa opima, rearing larvæ, 43, 65
Thanaos tages, sleeping position (fig.), 49, 269
Thecla rubi in N. Warwickshire, 141
Tineæ, certain, notes on, 113
Tourist's Handbook of European Butterflies, 96
Trichomma, 227

Valeria oleagina, the story of, 129
Vanessa antiopa at New Malden, 250; near King's Lynn, 250; at Weymouth, 250; *atalanta*, late appearance, 17; in North Devon, 271; *cardui* in North Devon, 271
Vanessidæ in summer, 183
Variation of European *Lepidoptera*, 97
Varieties of *Epunda luteola*, 14, 107, 143
Variety of *Lycæna argiolus*, 41

WARWICKSHIRE, NORTH :—
Lycæna argiolus and *Thecla rubi* in, 141
Wasp capturing *Sesia myopæformis*, 190
Wasps, late, 44
Water-insect attracted by glass, 21
WILTSHIRE :—
Salisbury, *Argynnis lathonia* and *Apatura iris* near, 182

Zeuzera æsculi, 92
Zygæna, the genus, new (?) form in, 18



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THE MACRO-LEPIDOPTERA OF UNST.

By J. JENNER WEIR, F.L.S., F.Z.S.

(WITH COLOURED PLATE.)

THE British Isles, small as they are when compared with some of the larger European countries, yet extend over almost eleven degrees of latitude, *viz.*, from 50° to nearly 61° N. lat.

The South of Cornwall and the Scilly Isles are about in the latitude of Dieppe, and the North of Shetland in that of Bergen in Norway, and further north than Cape Farewell in Greenland.

Mr. McArthur last year (1883), from the latter part of May till the beginning of September, collected insects in Unst, the most northern of the Shetland Isles, between 60° and 61° N. lat., or but little more than five and a half degrees from the Arctic circle. In this high latitude it is quite unnecessary to use a lantern for collecting in summer; the moths can be plainly seen on the flowers at midnight without artificial light. The nocturnal species fly from about 11.30 p.m. to 12.30 a.m., the period during which they can be taken lasting but one hour, so that the entomologist has to make the best use of his time. This Mr. McArthur appears to have done; and, taking every advantage of his opportunities, has returned with a most interesting and valuable series of Lepidoptera, which supplement those collected by him on Mainland, of which descriptions were given by me in the 'Entomologist' for the year 1880, vol. xiii., pp. 249-251 and 289-292; and 1881, vol. xiv., pp. 278-281.

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B

The following species new to the Macro-lepidoptera of the Islands have been added, viz. :—

| | | |
|----------------------------|---------------------------|--------------------------|
| <i>Sphinx convolvuli</i> , | <i>Agrotis cursoria</i> , | <i>Noctua glareosa</i> , |
| <i>Hadena exulis</i> , | <i>A. lucernea</i> , | <i>N. xanthographa</i> . |

These species, added to thirty-eight previously taken, raise the total number to forty-four ascertained to inhabit the Shetlands; of this number but thirty-two species were taken in Unst, including two butterflies, viz., *Pyrameis cardui* and *Vanessa atalanta*.

I am indebted to the kindness and courtesy of Mr. Clarence E. Fry for the examination of the most remarkable specimens, and for the opportunity of figuring them. Mr. McArthur has also permitted me, with equal kindness, to examine the bulk of the collection, for which purpose I visited him at Brighton.

The following remarks I deem worthy of putting on record :—

Hepialus humuli var. *hethlandica*.—The varieties of this species are more uniform in their markings and colouring than those obtained farther south, most of the species being tawny, with darker markings. The silvery males are rare, and never are quite like the normal form of the species, the thorax being always darker.

H. velleda.—These are not so brightly coloured as those captured on Mainland.

Noctua festiva.—A most beautiful series of this species was captured, some of a very rich chestnut-colour, with well-defined markings, as rich in colour as *N. brunnea*; and others, of the var. *conflua*, with the markings almost obsolete. Of these, three varieties are figured, Nos. 8, 9, and 10.

N. glareosa.—This is one of the gems of the collection; the ground colour of the upper wings, instead of the usual gray, is of a rich dark brown, *vide* figure 1.

N. xanthographa.—The specimens are mostly very dark, some with the distinct yellow spots, from which the name is derived; and in others the reniform and orbicular stigmata are almost obsolete.

Hadena exulis.—Of this insect, so rare in Britain, few were taken, but they are fine and large, and vary exceedingly; the yellow markings in some are very well-defined bands; a reference to the plate, Nos. 5, 6, 7, will show this peculiarity better than the most elaborate description. This may be regarded as the

most valuable species taken. The Rannoch form of the insect is also figured (No. 4) for comparison.

Agrotis cursoria.—Some of these are as dark as the *Noctua glareosa* figured; others are light, but with all the markings very sharply defined. These latter are very unlike the normal form. Figures, 2 and 3.

A. porphyrea.—The specimens are dark, and often strongly marked; others suffused; but all quite unlike those from Arran. There is almost an entire absence of the usual purple colour.

A. lucerneæ.—These are very large and dark.

Pachnobia hyperborea.—The general tint of the specimens is red, and they are more uniform in appearance even than those from Mainland.

Dianthœcia conspersa.—These are all of the true Shetlandic coloration, but lighter; some with the markings nearly obliterated, and of a dark leaden brown colour.

Aplecta occulta.—These are somewhat intermediate in colour between northern and southern specimens.

Dasypolia templi.—All the specimens are smaller than those taken in Mainland.

Emmelesia albulata var. *thules*.—The specimens, as a rule, are even darker than those figured in the 'Entomologist,' vol. xiii., plate 4, figs. 4 and 5.

E. venosata.—The ground colour of these is dark gray, but none were captured so dark as those from Mainland.

E. nanata (?).—I am not quite certain whether the specimens captured are really this insect, but am inclined to think they are extreme boreal varieties of it; some are very strongly marked with two dark bands across the fore wings; all are darker than the southern form. They are evidently the same insect as that figured in the 'Entomologist,' vol. xiv., plate 1, figs. 2 and 3; *vide* also p. 303 of the same volume.

Melanippe montanata.—It is singular to find that the specimens of this insect from Unst are finer than those from Mainland. They vary considerably in the intensity of the ground colour of the wings from light to dark gray, but none are white in this respect.

Campogramma bilineata.—The colour of these is peculiarly suffused, with very faint markings; the singularly dull appearance presented can scarcely be described,

Cidaria immanata.—The coloration is peculiar, but uniform; some have the central band red, as observed before in specimens from Mainland. This coloration is common enough in the allied species *C. russata*; but I believe, except in the form from Shetland, not known to occur either in Scotch or English *C. immanata*.

The remainder of the species taken do not present any important differences from the ordinary forms of the insects from Shetland to call for remark.

I have examined Mr. McArthur's diary, and find he took up his residence in the most northern house in the British Isles; so that this collection may be said to have been obtained in the veritable Ultima Thule.

The weather was distressingly bad; and when I read day after day such entries as "Stormy and wet, no chance of getting out;" "Dull day, no sun, no luck at all;" "Raining very fast, could not get out;" "Very stiff from the tumble last night;" "Stormy, still a prisoner;" I cannot but admire the resolution of Mr. McArthur. But he was at last beaten; and on September 8th he writes, "Nothing at all doing since 28th; so have made up my mind to go."

NOTES FROM WITHERSLACK.

By EDMUND SHUTTLEWORTH.

"WHAT a wretched season this has been for collecting!" one hears entomologists say on all sides. Granted that the weather has not been as propitious as it might have; but, taking all things into consideration, I have not found the season such a very unproductive one.

Unfortunately I have not collected much this year owing to want of time, but what I have done has been, in my estimation, very satisfactory, the following being an account of the first week spent by me at Witherslack this year, *viz.*, from Saturday, June 30th, until Saturday, July 7th.

On Saturday, June 30th, the day was very fine and warm, the sun shining brightly, and I took a nice series of *Pterophorus parvidactylus* flying over the flowers of wild thyme, upon which plant the larva feeds; also *P. lithodactylus* and two or three *P. osteodactylus* from among golden-rod. I was fortunate enough

to fill up my series of *Photodes captiuncula*. This little Noctua, which is very difficult to catch on the wing, owing to the rapidity of its flight and the harmonising of its colour with surrounding objects, was sunning itself upon the flowers of the ox-eye daisy, and was thus easily captured. *Xanthosetia hamana* was just out, and occurred at intervals; and the *salmacis* variety of *Lycæna agestis* was tolerably abundant. *L. alsus* and *Thanaos tages*, although plentiful, were worn.

Having heard, or read somewhere, of the attractive influence exerted by yew trees on Lepidoptera, I determined to take the opportunity of verifying the statement, so in the evening as it was getting dusk I sallied out, armed with a light long-handled net, to some promising-looking trees. Truly, I had been rightly informed, for not only moths, but Coleoptera, Diptera, innumerable columns of gnats and flies of all sorts, together with clouds of midges (which bit awfully hard), swarmed around "the attractive yew." I soon secured a series of *Batodes angustiorana*; and then devoted my attention to a small moth which was flying about, which proved to be *Eupithecia distinctata*. *Boarmia rhomboidaria*, *Camptogramma bilineata*, and *Hepialus humuli* were so common as to become a nuisance; especially *C. bilineata*, which, in the uncertain light, appeared like everything else except itself.

Monday, July 2nd, was fair but cloudy, with a slight wind. On that day I went upon Meathop Moss, and took a nice lot of the following:—*Acidalia fumata* and *Aspilates strigillaria* in very fine condition; *Chortobius davus* (nearly all males) plentiful, but rather worn; *Scodonia belgiaria*, one, a female, which laid a nice batch of eggs, which duly hatched, and are now feeding upon willow; two specimens of *Hyria auroraria*; and sundry *Euthe-monius russula*, *Agrotis porphyrea*, and *Anarta myrtilli*. The females of *A. strigillaria* and *A. fumata* I find lay freely when left in a pill-box. The eggs of *A. strigillaria* are straw-coloured, oblong in shape, and slightly broader at one end, on the top of which is a circular indentation. When viewed through a small pocket-lens they had the appearance of minute grains of wheat. They were not laid in any particular pattern or manner, but higgledy-piggledy, singly or in clusters, all about the box. The eggs of *A. fumata* are of a pale greenish colour when fresh laid, but soon change to a pinkish hue, are oval in shape, taper

slightly at one end, and are ribbed, the ribs being formed apparently by a series of small indentations running parallel to each other all round and from end to end of the egg. They were laid end on round the sides of the pill-boxes. The rain came on about 4 o'clock, and continued until 7, when I went to a rough, rocky piece of ground, about half a mile from the inn, and tried sugar, but no moths came to it; and the rain, which began to fall again about 10 p.m., soon washed it away. I found *E. pulchellata* and *Bryophila perla* sitting on the rocks; and netted one *P. osteodactylus*, and a few *Pseudoterpna cytisaria*, *Eubolia palumbaria*, *Nudaria mundana*, *A. remutata*, and *E. distinctata*.

On Tuesday, July 3rd, after I had finished setting my previous day's captures, I collected some larvæ which were feeding upon the flower-heads of the ox-eye daisy. The head is a lightish brown; the body smooth and greyish in colour, with black dots placed in pairs on every segment. It bends over the leaves of the flower, and feeds concealed upon the petals, making a kind of gallery in them. I am inclined to think that it pupates in the flower, as I found two chrysalids in the flower-heads. The pupa is longish and slender; the wing-cases and thorax dark brown, almost black on the shoulders; body light brown, with a reddish tinge on the edge of the segments on the back; and the whole is generally darker above than below. I have since bred the moth, and found it to be *Sciaphila octomaculana*. The larva of *Nudaria mundana* was common on the lichen-covered walls. In the afternoon, which was dull, close, and thundery, I went searching for insects at rest upon rocks. Rock searching is terribly back-aching work, but a good many insects may be taken in this way, repaying a careful searcher. I used no net, but simply boxed the moths as I found them, and succeeded in taking the following:—*E. pulchellata* (seven; I also found the larva about a quarter grown upon the foxglove), *A. promutata* (two), *H. velleda* (two), *P. cytisaria* (three), *Hadena glauca* (one), *Acronycta rumicis* (two), *Nudaria mundana* (three), *Sciaphila penziana* (one), and a few other small things. In the evening I again tried the yew trees, and took *E. distinctata*, *P. captiuncula*, *Eupœcilia sodaliana* (four), a very dark variety of *Gnophos obscurata*, *Plusia v-aureum*, *P. iota*, and *Axylia putris*.

Wednesday, July 4th, was cloudy and thundery. I spent the morning upon Faraway Moss, where I captured the following:—

A nice lot of *H. auroraria*, as fine as bred, all males but one; a goodly number of *Chortobius davus* in splendid condition, and all females (it will be remembered that those I took on Meathop Moss were nearly all males, and worn), *A. fumata*, *A. strigillaria*, and *Euthemonia russula*.

I was busy setting until evening, when I again successfully worked the yews, and obtained a dozen more *E. distinctata*, two *E. sodaliana*, one *A. aversata*, two *A. incanaria*, two *Emmelesia alchemillata* on the wing, one *E. pulchellata*, and two *H. dentina* sitting upon the rocks.

Thursday, July 5th, was dull, showery, and windy, with occasional gleams of sunshine. I spent a couple of hours on Faraway Moss in the morning, and took *H. auroraria*, *A. myrtilli*, and one or two larvæ of *Bombyx callunæ*. The wind falling towards evening I started off, in company with a friend, upon sugaring intent; and although we remained out the whole night until 5 a.m., and the evening was apparently all that could be desired, our only capture at sugar was a solitary *A. rumicis*. I swept the heath for larvæ of *A. myrtilli*, but had not taken many when I broke my net. However I caught the following moths flying at dusk:—*Mamestra furva* (one), *A. putris*, *A. porphyrea*, *H. velleda*, *N. mundana*, *E. alchemillata*, *H. auroraria*, *Pelurga comitata*, *E. nanata*, and a few Tortrices.

On Friday, July 6th, the morning was cloudy at first, and then clear; the sun shone intensely hot, but a strong south-west breeze blowing made it very difficult to use the net. Fortunately I found a sheltered spot at the back of some birches on the Moss, and after working for three hours was rewarded with two dozen *H. auroraria*, sundry *A. myrtilli*, and *C. davus*. Walking home along the roadside I saw and captured my first specimen this year of *Vanessa cardui*, which was seated upon a thistle-head. It was apparently a hybernated female, as it was very much worn.

In the evening I again worked the yews, and caught *E. alchemillata*, *A. incanaria*, *E. decolorata*, *E. distinctata*, *E. subfulvata*, and some Tineæ and Noctuæ.

On Saturday, July 7th, the weather was very similar to that of the preceding day. I spent the morning on the heath, and took *A. myrtilli*, *H. auroraria*, *L. mesomella*, *H. sylvanus*, *C. russata*, *E. russula*, *C. davus*, and *Crambus margaritellus*.

In the evening I was out for a short time, and took a few *X. hamana*, one *Scotosia vetulata*, one *A. incanaria* and *Gelechia sequax*; and then the rain came down so heavily that I was driven to my inn.

Taking weather and everything into consideration, I think I did a very good week's work.

I have also taken at Witherslack this year *E. rupicolana* and *P. microdactylus* among the *Eupatorium cannabinum*, and two *Depressaria albipunctella*, which were all new species to me; also larvæ of *Coleophora wilkinsoni*, *C. limosipennella*, *Micropteryx sparmannella*, *E. pulchellata*; imagines of *G. atrella*, *Crambus falsellus*, *Æcophora fuscescentella*, *Carsia imbutata*, *Schrankia turfosalis*, *Rivula sericealis*, &c.

Breeding has not been a great success:—*E. plumbeolata* (a few), *E. pulchellata*, *E. venosata*, *E. distinctata* (a few), *E. absynthiata*, *Dianthæcia capsophila*, and a few common species of Geometræ and Tortrices, making up the sum total.

I sincerely hope others have met with the same success in collecting that I have. If they have not, all I can say is do not be discouraged by your own want of success, and the melancholy reports of brother unfortunates, but stick to Teucer's maxim, *Nil desperandum*, and hope for a better harvest next year.

8, Winckley Square, Preston, August 30, 1883.

LEPIDOPTERA AT NOTTINGHAM.

By W. T. WRIGHT.

In giving a short review of the season, as regards Lepidoptera, I cannot do better than take each month in succession from February to August, inclusive, and enumerate my captures in each.

I commenced collecting on February 21st, thinking that the spring-like weather of the few days previous would no doubt start the early species from their dormant state. My conjectures proved to be correct, for *Hybernia rupicaprararia* and *H. progemmaria* were to be seen in abundance on the leafless twigs of the hawthorn. But these few days of congenial weather soon came to an end, and were followed by severe frosts and north-east

winds. This of course soon put a stop to the appearance of insects; and it was not until the middle of March that I went out again, but without result, as nothing came under my notice during the month beyond the two species already named.

During April, at "sugar" and sallow bloom, I had a busy time: *Taniocampa gothica*, *T. instabilis*, and *T. stabilis* came in countless numbers; also *T. gracilis*, *T. cruda*, *Gonoptera libatrix*, and *Scotosia dubitata*, but these latter were less common. Towards the end of the month *Selenia illunaria*, *Anticlea badiata*, and *A. derivata* were taken in fair numbers.

The month of May opened very cold; and it was not until the 15th that I was able to go out with any likelihood of success. The following species were taken in more or less abundance during the month, viz., *Odonestis potatoria* (larva), *Rumia cratægata*, *Odontopera bidentata*, *Hemerophila abruptaria*, *Corycia temerata*, *Cabera pusaria*, *Fidonia piniaria*, *Eupithecia vulgata*, *Melanippe fluctuata*, *Coremia ferrugata*, *C. unidentata*, *Cilix spinula*, *Heliodes arbuti*, *Plusia gamma*, *Euclidia mi*, *E. glyphica*. The Diurni were only represented by the usual members of the family of the *Pieridæ* and *Anthocharis cardamines*.

June was a grand month as regards the weather; and, by referring to my diary, I find that every day I had some capture or other to record. June 4th, being a lovely day, I visited Newstead Park and the adjacent woods, near Mansfield. *Argynnis euphrosyne*, *Chortobius pamphilus*, *Polyommatus phlæas*, *Lycæna alexis*, *Satyrus janira*, *Syrichthus alveolus*, and *Hesperia sylvanus* were the only Diurni noted, but these were common. *Zygæna filipendulæ*, *Euchelia jacobææ*, and *Emmelesia albulata* were common on the pastures. I also took a pair of *Procris statices* in the same locality, this being the first time I have seen it in the county. In the woods, by beating the bushes, *Iodis lactearia*, *Lomaspilis marginata*, *Abraxas ulmata*, *Larentia pectinitaria*, *M. rivata*, and *M. galiata* were put up in good numbers, mostly in fine condition. *Melanthia albicillata* was evidently just coming out, a few only being taken. In a Scotch fir plantation many *F. piniaria* were seen flitting round the tops of the trees, but they were considerably worn. Two specimens of *Ypsipetes impluviata* in the same wood concluded my captures for the day.

My evening collecting during this month was fairly successful.

Hepialus lupulinus and *H. humuli* swarmed in every locality in which I searched; *H. sylvinus* and *H. velleda* were taken sparingly at Colwick Wood, two miles from Nottingham; *M. montanata*, *M. subtristata*, *L. didymata*, *Camptogramma bilineata*, and *E. vulgata* were everywhere a perfect nuisance to the collector. At sugar *Miana strigilis*, *M. furuncula*, *Acronycta psi*, *Axylia putris*, *Mamestra brassicæ*, *Agrotis segetum*, *Noctua plecta*, *Epunda viminalis*, *Phlogophora meticulosa*, *Euplexia lucipara*, and *Hadena oleracea* were all common. I found the flowers of *Lamium rubrum* to be a wonderful attraction to the genus *Plusia*,—*P. chrysitis*, *P. iota*, and *P. gamma* being seen nightly in great profusion at these flowers. Collecting off palings surrounding woods early in the morning produced *H. thalassina*, *Apamea basilinea*, *Cucullia umbratica*, *Abrostola triplasia* (common), *Notodonta camelina* (few), and *N. dromedarius* (one specimen), besides several of the species taken at sugar. A few each of *Smerinthus populi* and *S. ocellatus* were taken at rest on the trunks of poplar and willow trees.

The Diurni during July were very poorly represented by only the following five common species:—*A. adippe*, *S. janira*, *S. tithonus*, *S. hyperanthus*, and *H. linea*.

I found the sheltered avenues of gardens in the evening to be very productive:—*Arctia lubricipeda*, *A. menthastri*, *Liparis auriflua*, *Uropteryx sambucata*, *Selenia illunaria* (second brood), *Boarmia rhomboidaria*, *Abraxas grossulariata*, and *Halia wavararia* were all common; whilst occasionally I met with *Pericallia syringaria*.

At sugar, in the same localities, such common Noctuæ as *Xylophasia lithoxylea*, *Mamestra persicariæ*, and *Agrotis nigricans* were a pest.

In the woods sugar produced *Triphæna janthina*, *Agrotis corticea*, *A. tritici*, *N. augur*, *N. c-nigrum*, *Leucania comma*, *L. lithargyria*, *Thyatira derasa*, *Xylophasia rurea*, *X. hepatica*, *Caradrina cubicularis*, and many others in more or less abundance.

In the lanes at dusk, with the net, I secured good series each of the following:—*Metrocampa margaritaria*, *Hemithea thymiararia*, *Acidalia imitaria*, *Timandra amataria*, *Cidaria immanata*, *C. fulvata*, *C. pyraliata*, and *Pelurga comitata*; a splendid pair of *Cossus ligniperda* were taken at light, along with a specimen of

Zeuzera æsculi; *Sesia tipuliformis* was common on the currant trees when the sun shone.

Collecting during August has been quite a failure; I have never before experienced such a dearth in Lepidoptera. I tried sugaring almost nightly; but time after time I have returned home without having boxed a single specimen. *Vanessa atalanta* and *V. cardui* were the only Diurni to be found, but they have been extremely abundant. My evening captures with the net were also very disappointing, only *Epione apiciaria*, *Crocallis clingularia*, *Ennomos tiliaria*, *E. fuscantaria*, *Scotosia dubitata*, *S. rhamnata*, *C. spinula*, *Charæas graminis*, coming under my notice during the whole month.

Taking everything into consideration I have no great cause to complain of the season just drawing to a close; but if we are to consider that the abundance or scarcity of the autumnal larvæ has anything to do with next season, I am afraid collectors will experience a much worse time than has been the case this year.

40, Long Hedge Lane, Nottingham, Oct. 23, 1883.

A VOICE FROM THE MINEHEAD VALLEY.

BY THE REV. T. SEYMOUR ST. JOHN.

AN account of what I have been able to do in the entomological hunting-grounds of this neighbourhood during the "bad season" of 1883 may perhaps prove of interest. What I have to record must not be taken as a criterion of what can be done in this part of Somerset: first, because it is but the account of one season; secondly, my entomological experience and knowledge are as yet limited; and thirdly, I have not been able to give the time to research and investigation which others could. Still one of experience might, I believe, do great things about here, although I am unable as yet to record the capture of any great rarity, and write this in the hope that some one may be induced to try.

Standing on the top of the Quantock Hills, just above this house, and looking over the valley towards Willett Tower and the Brendon Hills, an entomologist would at once exclaim, "That ought to be a rare part for Lepidoptera." So, indeed, it looks:

plenty of woods; oak and beech copses; plantations here and there; a pine and larch wood stretching all along one side of Will's Neck; high hedges; plenty of grass-land; large tracts of rough ground covered with heather, bramble, and bracken; besides immense quantities of heath, &c., on the Quantocks; boggy, damp meadows in the bottom of the valley; abundance of sallows all along the railway line and elsewhere; high railway-banks bordered by woods;—in fine, a variety of ground not often met with within so small a compass.

Whether my own unfulfilled hopes and disappointments are the result of a bad season, or of my want of knowledge respecting Lepidoptera, or of both, I know not. However, the following is my report for the past year:—

January produced one specimen of *Hybernia rupicaprararia*; and during February I caught several specimens of *Lemnatophila salicella* flying round an ash; and in March, one *Xylocampa lithoriza* and two *Diurnea fagella*.

During April two or three turns at the sallows produced but the common *Tæniocampa gothica*, *T. stabilis*, and *T. cruda*. I took at dusk two *Selenia illunaria*, two *Cidaria suffumata*, and one *Anticlea badiata*. On the Quantocks I took by day a specimen of *Pachynemina hippocastanaria*, on the 12th. One hibernated *Scopelosoma satellitia* alone represented the Noctuæ, caught at sugar.

When May arrived Diurni showed up by no means plentifully, my note-book recording the usual members of the Pieridæ, *Anthocharis cardamines*, *Argynnis euphrosyne*, and *A. selene*, but these were in no abundance. The Geometræ were represented but by few species, among which I noticed *Odontopera bidentata*, *Cabera exanthemaria*, *Lomaspilis marginata*, *Anticlea rubidata*, and *A. badiata*. Occurring in abundance was *Panagra petrararia*, *Melanippe montanata*, and *Cidaria suffumata*. The Noctuæ were very scarce, at least to me; *Xylophasia rurea* only was plentiful, although I saw a few others equally common, and one *Phytometra ænea*. Of the Micros I can only name *Pionea forficalis*, *Ebulea sambucalis*, *Tortrix ministrana*, *Spilonota roborana*, *Pardia tripunctana*, *Adela viridella*, and *A. fibulella*.

In June the only butterfly different from those mentioned in May, which came across my path, was a hibernated *Vanessa cardui*. Without comment I give a considerable number from the

list of my captures this month :—*Hepialis velleda* from the top of the Quantocks, *Nola cristulalis*, *Arctia menthastri*, *A. lubricipeda*, and *Bombyx quercus*. Noctuæ were scarce, and sugaring almost useless : I took *Acronycta rumicis*, *Axylia putris*, *Agrotis porphyrea*, *Noctua plecta*, and *Dicranura furcula*. Geometræ were more plentiful, some of those which I noticed being *Iodis lactearia*, *Acidalia fumata*, *Numeria pulveraria*, *Larentia pectinifera*, *Emmelesia affinitata*, *E. alchemillata*, *E. decolorata*, *Eupithecia castigata*, *Ypsipetes ruberata*, *Melanippe unangulata*, *Eubolia palumbaria*, and *Anaitis plagiaria*.

July proved a wet month in a decidedly rainy district ; hence my list of captures and notes is limited, being as follows :—*Hepialus hectus* and *H. lupulinus* abundant everywhere ; *Macroglossa stellatarum* was common ; *Euchelia jacobæ*, *B. quercus*. Noctuæ were still scarce at sugar, *Thyatira batis* and *Apamea basilinea* being among the few to put in an appearance. Of the Geometræ I took *Ourapteryx sambucata*, *A. aversata*, *Halia walaria*, and *C. fulvata*. I also captured a few *Crambus pine-tellus* and *Botys urticata*.

Being from home nearly the whole of August, I can only record *B. quercus* ; and of the Noctuæ, *Hydræcia nictitans*, *Neuria saponariæ*, *Heliophobus hispida*, *Charæas graminis*, and *Plusia iota*. *P. gamma* has been a perfect plague throughout the autumn. The Geometræ include *S. illunaria* and *Y. elutata* ; and the Micros, *C. pinetellus*.

The best bit of hunting I have had at all this year was on the evenings of from October 22nd to 25th, when I visited two clumps of ivy covered thickly with blossom. The evenings were still and very dark, but moths were feeding each night in plenty ; and a pleasant time I had. I took *Himera pennaria* (two, at light), *Thera simulata*, *C. psittacata*, *C. miata*. Of the Noctuæ, *Orthosia lota*, *O. macilenta*, *Anchocelis lunosa*, *A. litura*, *Cerastis spadicea*, *Scopelosoma satellitia* (two varieties), *Hoporina croceago*, *Xanthia ferruginea*, *X. rhizolitha*, and some others.

In conclusion I may mention that *B. rubi* and *Saturnia carpini* are plentiful on the Quantock Hills, although I have not succeeded in capturing either on the wing ; so also is *Anarta myrtilli* on Will's Neck. One strange fact I may add, which is that I have only seen one species of the genus *Xanthia*, although fallows are so plentiful.

EPUNDA LUTULENTA AND ITS VARIETIES.

BY W. F. DE V. KANE.

SEVERAL variations of this insect are described by Guenée and Herrich-Schäffer, none of which seem to me to correspond to the dark brown form taken in Scotland; in Galway, by Mr. More; and in Sligo, by Mr. Russ. This passes I find under the name of *luneburgensis*, but I think erroneously; and, if I am correct, it should be described and named as a distinct variety, being constant in coloration, and not confined to either sex or locality.

E. lutulenta (W. V.) is given as follows:—Of a dark sooty gray, with pencillings scarcely visible, and only the reniform streak and sublateral line somewhat better marked, and joined to shadings of somewhat warm brown. The female darker, with hind wings of a uniform dusky colour. This I take to be pretty much the English normal type of *E. lutulenta*.

Guenée describes three varieties as follows:—

Consimilis (St.), female var.—Of paler gray, but with pencillings as slightly marked.

Lutulenta, Hüb., female var.—Of a gray mouse-colour, with the two median lines very slenderly, but distinctly, marked in black, the sublateral being more strongly marked. Hind wings white to the centre, with a median line scarcely visible above, but on under side a well-marked lunule opposite the cellule. South France.

Sedi, male and female (Bdv. in litt.).—Of ash-coloured gray, with deeper median band; all the lines well marked, duplicate, bordered with warm brown. The stigmata clearer, but the lower portion of the reniform shaded blackish. The hind wings of female of lighter hue than in the type, with traces of a median line. Central and South France.

Guenée states that he has never seen var. *luneburgensis*, but, "judging from the figures of Herrich-Schäffer, considers it to approximate closely to our form," *i. e.*, I presume that of *E. lutulenta* (W. V.).

On reference to the illustrations in question, it will be seen that the two female (?) insects are represented of different shades

of brown, with all the lines drawn broadly in a paler tint, as also the outline of the stigmata. Hind wings of both darkly shaded. In fact the darker specimen reminds one strongly of *Luperina cespitis* in general colour and manner of pencilling.

The female (?) var. of H.-Schäffer, neither in depth of colour, marking, nor in being confined to one sex (?) seems to correspond to the Scotch and Irish insects to which I refer.

Staudinger's short description of the two varieties tallies with the above, and more forcibly illustrates the dissimilarity I allege to exist:—

“Ab. et var. *luneburgensis* (Frr., H.-S., Gn.). — Nigricans, fasciis distinct. albis.”

“Ab. et var. *sedii* (Gn.), *lutulenta* (Dup., iii., 18, 1). — Omnino cinerascens. fasciis distinct. nigris.”

In the Doubleday European collection there is a dark ashy gray variety, with blackish and light gray delineation, marked “*luneburgensis* ;” and in the fine cabinet of Mr. Tugwell, of Greenwich, there are two Scotch specimens, one of which is a dark ash-coloured gray, with sepia brown lines and markings distinctly traced, and not very narrow, bordered with paler shading. Orbicular distinct, of pale area on darker ground. Reniform only partly traceable.

The above description I wrote down when examining the specimen, and it will be seen to correspond pretty nearly with Guenée's *sedii*.

The other is the dark brown form, which occurs in the West of Ireland also, and is exactly identical. It may be roughly described as having the exact coloration of *E. nigra*, i. e., a deep sepia brown-black, with (as in *E. nigra*) pencillings indicated, not in colour, but in the glossy texture of the wing. I have seen both male and female of this variety, the hind wings of the latter being dusky. In fact, the insect seems only distinguishable from *E. nigra* by the antennæ of the male, and the dentation of the sublateral line on the fore wings of both sexes.

Sloperton Lodge, Kingstown, Co. Dublin.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THE SEASON AT ILFRACOMBE.—In common with many of your contributors, my brother and I found this an exceedingly bad season. At Ilfracombe we sugared four or five times, but were only rewarded by a few *Xylophasia polyodon*, while our efforts during the day did not meet with much better success. Later in the month (August), at Jersey, I was able to take a few *Colias edusa*, but even there the insects were by no means plentiful.—C. DASHWOOD SNELL; St. John's College, Oxford, Nov. 5, 1883.

LEPIDOPTERA AT CAMBRIDGE.—My entomological researches during the past year have been confined to the environs of the town of Cambridge, and it is surprising what a long list of Lepidoptera may be made out in the town itself and its immediate neighbourhood. If it is so with all towns, as I suppose it is, what a long article might be written on urban Entomology. I have noticed among the Diurni, within a radius of two miles from the centre of the town, *Argynnis selene*, *Vanessa urticæ*, *V. io*, *V. polychloros*, *V. atalanta*, *V. cardui*, one specimen of *Apatura iris* (in 1868, but none since), *Arge galathea*, and four species of the genus *Satyrus*. *Colias edusa* and *Gonepteryx rhamni* not only fly in the suburban meadows and gardens, but along the streets in the centre of the town. The same remark may be made respecting *Anthocharis cardamines* and the genus *Pieridæ*. *Chortobius pamphilus* and *Hesperia sylvanus* may be seen just outside the town; and I used to see *Papilio machaon*, but have missed it of late. I noticed that the larvæ of *Pieris brassicæ* seemed this year much less infected with *Apanteles glomeratus* than usual. Among the Sphingidæ I have met with *Smerinthus ocellatus*, *S. populi*, *S. tilia*, *Acherontia atropos*, *Sphinx convolvuli*, *S. ligustri*, *Chærocampa elpenor*, and *C. porcellus*; but all appeared this year in less abundance than usual.—A. H. WATERS; Willoughby House, Mill Road, Cambridge.

ABNORMITIES IN LEPIDOPTERA.—It was with considerable satisfaction that I read Mr. Harding's notes in the November 'Entomologist' (Entom. xvi. 257) on the above subject, and in the hope that they may be of interest I append the following notes. In 1877 I bred a male specimen of *Bombyx callunæ*,

minus the left hind wing, but perfect in every other respect. During the larval stage I failed to notice any peculiarity. Also, in the same year, I reared from a brood of *Liparis dispar* the constantly recurring variety in the male (figured in this magazine some time since), with the "crescent-shaped" pieces missing from the hind wings. There is no doubt that this is a subject which would repay careful investigation. In support of the theory that the variation is caused in the larval stage, I would refer to the 'Entomologist' for November, 1878, vol. xi., p. 186, in which I mention two varieties of *Vanessa io* bred from larvæ in that year. After a careful examination of one of these, my friend Mr. Barwell Turner writes as follows:—"Although apparently melanic, this variety is not so, the dark appearance being due to other causes than coloration. The colour (or absence of it?) in the upper wings is most extraordinary, with a semi-metallic glaze in the parts usually a clear dark red-brown in normal specimens. On microscopic examination (in sunlight) this appears to be due to the absence of the typical Vanessid scales, which are replaced by short reddish brown hairs, the glazy appearance of the wing surface being seen through these. These hairs may represent undeveloped plumules or scales; but why the other plumules on the wing are well and normally developed is hard to imagine. The eye-spot is hardly so brilliant as in ordinary specimens. The under side is of the usual character." I recollect when taking these larvæ crowding them into a tin box, which had the usual effect of making them perspire; and I believe this to have been the cause of retarding the scales on some parts of the imago in their growth. Like Mr. Harding I should like to know what other entomologists have noticed on this interesting point.—HENRY MARSH; Leeds, November 16, 1883.

LATE APPEARANCE OF VANESSA ATALANTA. — Several fine specimens of *V. atalanta* emerged in my breeding-cage on Friday, November 9th, 1883. Has any other collector seen such a late emergence of this species? — G. D. SMITH; 7, Constitution Street, Aberdeen, November 16, 1883.

ACHERONTIA ATROPOS.—A specimen of this insect was sent to me in the latter part of September, having been caught by some friends of mine in their dining-room. I believe it is the first specimen of *A. atropos* which has been captured in this neigh-

bourhood this season. I will also remark that on the 30th of April I saw here the first specimen of *Pieris rapæ*, which species has been more than usually abundant, both in the spring and summer broods. It was also very abundant at Ramsgate. I may also remark that vegetation in our garden has been particularly free from larvæ of Lepidoptera and other insects this season: I think this is attributable in a great measure to improved gardening, *i. e.*, carefulness in clearing away all kinds of refuse, and I think the improved mode of cultivation generally throughout the country, the substitution of iron fencing for hedges, iron sheds, and various improvements of the same description, have not been taken into consideration in accounting for the diminution of Lepidoptera of late years, less shelter allowing them fewer chances of escaping destruction both from birds and storms.—CLARA KINGSFORD; Barton House, Canterbury, Oct. 31, 1883.

THE NEW(?) FORM IN THE GENUS *ZYGÆNA*.—I think it is scarcely advisable at present to raise the form of *Zygæna loniceræ*, described by Mr. W. Prest (Entom. xvi. 273), to the distinction of a named variety. As I stated at the meeting of the London Entomological Society, when Mr. Prest's specimens were exhibited, I bred a number of exactly the same form in *Z. filipendulæ* from cocoons collected at Onchan, in the Isle of Man, in June, 1873. At the date of the meeting I was under the impression that I had none of the specimens in my possession; and it was not until two or three weeks ago, when looking at the genus in my cabinet, I found that there was one of the specimens in my series of *Z. filipendulæ*. It is of exactly the same colour as Mr. Prest's variety, *Z. eboracæ*, has the same washed appearance, has the same narrow brown border to the hind wings, and the same white (though, as in Mr. Prest's specimens, indistinctly so) cilia. I remember distinctly that at the time I bred the specimens many of them were crippled, and I attributed the variation to a probably diseased condition of the larvæ. But whatever the cause may be, I have no doubt that under similar conditions the same form would occur all through the genus.—GEO. T. PORRITT; Huddersfield, December 1, 1883.

SCIENTIFIC NOMENCLATURE. — Mr. Prest, in his note on *Zygæna lonicera* (Entom. xvi. 273), does not give his authority

for saying that Ebor was the ancient name of York. Possibly he means Eboracum; but, if he does so, it is difficult to see how he arrives at the name *eboracæ*, which, having no meaning, is certainly open to objection as a new name.—C. A. BRIGGS; 55, Lincoln's Inn Fields, December 5, 1883.

COSSUS LIGNIPERDA IN IRELAND.—In Mr. Birchall's 'Catalogue of the Lepidoptera of Ireland' (1868) this insect is mentioned as occurring in "Wicklow, apparently scarce." The late Mr. R. W. Sinclair, in his 'Notes on Irish Lepidoptera,' says, "The larvæ at Leixlip" (Co. Dublin). I am able to mention two other counties where the larvæ have occurred, *viz.*, Waterford and Kings Co. In June last I was brought about two dozen of these highly, but not pleasantly, perfumed larvæ. They were found in a large oak recently felled in this locality. I was told that they tumbled pell-mell out of their tunnels as soon as the axe began its work. These larvæ I kept in a large tightly fitting tin box, perforated with holes for the admission of air, and too small for their escape. They seemed to thrive fairly well for several months, but never appeared to increase in size. Having been from home for some time I took a look at them on my return, and was surprised, and a good deal disappointed, to find only two. Where the rest disappeared to I cannot positively say, but surmise that they were devoured by the others. This was not a case of the "survival of the fittest," for their repast did not at all agree with them, and they died quite lately, and were preserved. The other locality is along the banks of the Nore, near Castletoun, Kings Co. The larva was found here in ash trees by Mr. J. Neale, one of the masters of Newtown School, Waterford.—[Rev.] WILLIAM W. FLEMING; Clonegam Rectory, Portlaw, Co. Waterford, December 3, 1883.

SESIA BEMBECIFORMIS AT LEICESTER.—On the 23rd March, 1883, having heard that labourers were cutting the osiers on an osier bed belonging to the Leicester corporation, I obtained the kind permission of the town surveyors, and, with the assistance of a friend and my saw, I obtained upwards of 150 sticks with nearly full-fed larvæ of *S. bembeciformis* in them. Not having room for them all, I sent the greater number of them to friends. The results from those retained were as follows:—Out of twenty-four pupæ, carefully taken on May 14th from the sticks, I only

obtained nine imagines; out of these two were cripples, and the others were not of a bright colour. Out of the twenty-four sticks placed in a cage, with the holes downwards and covered in two inches of sand, I obtained twenty-three perfect specimens, and but one cripple. These emerged during June, from 6th to 16th, the cripple being last. I therefore think it the best plan to keep them in the osier sticks. I regret that I have no more for friends, and should like to know results of those sent away. I might say that in no instance did the larvæ reach more than ten inches in the sticks from the root. A great many larvæ were knocked out and killed by the rough way in which the sticks were cut. I found twenty-eight living larvæ on the ground, which I preserved. —W. TRISTRAM; Havelock Cottage, Gosling Street, Leicester, December, 1883.

PERONEA COMPARANA DOUBLE-BROODED.—During the month of June I collected a number of puckered leaves on the strawberry-plants for larvæ of *Peronea comparana*. A few days later I went for more, but to my surprise I found a lot of sparrows at work, the leaves being torn and pecked bare of both larvæ and pupæ. However, I bred a quantity in July. Again, in September, I visited the place, and got a fresh supply of both larvæ and pupæ; the moths came out up to the middle of October. I saw no difference in the variations from the earlier brood. Some few years ago I saw large beds of strawberry entirely destroyed, the moths rising up in thousands. This species seems to vary considerably; some of them like *Peronea schalleriana*, but not as large nor yet as bright in coloration. —J. B. HODGKINSON; 15, Spring Bank, Preston, November 14, 1883.

COLEOPTERA IN 1883.—On the few occasions I have been able to devote to "sweeping" this season I have found Coleoptera in some parts of Surrey abundant. My first venture for this purpose was to Esher and neighbourhood on May 14th. The weather was comparatively fine and mild, though showery at times. Several things were rather common, such as *Prasocuris aucta*, *Phyllobius alneti*, *P. oblongus*, a few *P. calcaratus*, and *Ceuthorhynchideus troglodytes*; also took two or three specimens of *Liophlæus nubilus*, *Grypidius equiseti*, *Gymnetron pascuorum*, and about a dozen of *Lema melanopa* and *L. cyanella*. Visiting the same locality on three Saturdays in June, I swept some half-

dozen *Anthocomus fasciatus*, a few *Chrysomela staphylæa* and *C. polita*, and several *Phyllobii*; also *Phædon cochleariæ*, *P. betulæ*, and *P. tumidulum*; *Gastrophysa polygoni*, *Priobium castaneum*, and a host of other things. On July 7th I journeyed to Farnham. This spot is worth working, and I have wondered how it is that so good a locality is neglected. I commenced sweeping for *Malachius ruficollis* shortly after my arrival, and captured some thirty specimens; I also found *Prasocuris marginella* rather common; *Erirhinus maculatus* common on willow; *Donacia linearis* common on bulrushes; with the latter I found *D. typhæ*, *D. lemnæ*, and seven *D. sagittariæ*; in close proximity to the latter I discovered a specimen of *Anomala frischii*. *Gyrinus marinus* was very abundant: I obtained about forty in one dip with my net. Continuing my researches at Esher on August 6th and September 22nd, I captured a late *Donacia bidens* on each occasion, and about fourteen *Malachius ruficollis*. Sweeping among the marshy places, I netted several *Chrysomela didymata*, *E. hyperici*, *C. polita*, and *C. staphylæa*; also a dozen *Coccinella 19-punctata*, some *C. hieroglyphica*, *C. 22-punctata*, and *C. 11-punctata*, to say nothing of swarms of *C. 7-punctata*; *Adimonia suturalis* and *A. caprea* were everywhere; *Scirtes hemisphæricus* was also in some numbers, and likewise *Plectroscelis subcærulea*. On September 29th I went for *Plagioderma armoraciæ*, but owing to wet weather I was able to obtain only six. However, on the following Saturday my friend Mr. Cripps procured about two dozen specimens from the same locality. Taking the season from beginning to end, I have every reason to be satisfied with the results of my exertions. — G. LEWCOCK; 40, Oxford Road, Islington, N., November 15, 1883.

A WATER-INSECT ATTRACTED BY GLASS.—With reference to the notes in the 'Entomologist' (Entom. xvi. 286) on water-beetles mistaking glass for water, I have several times noticed some of the smaller species do so, which reminds me of an instance where a specimen of *Gerris lacustris*, L., was found by me on the floor of a room in front of an open window in the suburbs of this town in 1869. The creature in aiming at the glass must have just missed it, and so passed into the room, where it lay helpless. Its home could not have been less than a quarter of a mile away.—J. E. FLETCHER; Worcester, December 3, 1883.

HEMEROBIOUS? OR CHRYSOPA?—In two successive months past (Entom. xvi., pp. 259 and 284) I noticed references to lace-wing flies, under the name of *Hemerobius*. The descriptive remarks in the first, and the odour alluded to in the second, of these communications, render it all but certain that the insects in question must belong to the genus *Chrysopa*, and probably to the species *C. septempunctata*, which is the chief of our "stink-flies." This insect was commoner than usual last summer. *Hemerobius* and *Chrysopa* appertain to distinct families, *Hemerobiidæ* and *Chrysopidæ*.—J. E. FLETCHER; Worcester, December 3, 1883.

ENTOMOLOGICAL EVENINGS AT THE ROYAL AQUARIUM. — On December 3rd the usual Monday evening meeting was held on the invitation of Mr. Carrington, and was well attended. Among the many specimens of insects exhibited were especially to be noted those by Mr. Billups, which included forty-eight species of Ichneumons, including *Ophion minutus*, *Ichneumon sanguinator*, *Phylodietus fabricator*, &c.; a handsome series of sixty Diptera, many being rare; a number of Aculeate Hymenoptera; also a box containing the life-history of the celery-fly (*Tephritis onopordinis*), with their parasites reared on the day of the meeting; all these were very beautifully mounted. Mr. Mera's exhibit was bred *Fidonia conspicuata* and *Corycia temerata*. Mr. E. H. Jones brought bred examples of *Cucullia gnaphalii* and *Acronycta alni*, reared by himself. Larvæ of Sphingidæ, preserved by Mr. Edward Lovett in a saturated solution of alum, as an experiment in 1880, drew much attention from those present, on account of the success of the system. Mr. Jobson showed two varieties of *Apatura iris* from the New Forest. Mr. Cooper's box contained very fine varieties of *Polyommatus phlæas*, *Arctia caja*, *Stauropus fagi*, and *Boarmia repandata*. The most striking exhibit of the evening was a very remarkable variety of *Abraxas grossulariata*, the centre of the anterior wings being richly suffused with bright orange-colour; none present had seen this form before. This, with others, all having a tendency to the abnormal orange coloration, was taken during the past season by Mr. Gee in a garden in Islington. Mr. T. W. Hall showed a box containing types of Lepidoptera taken at Folkestone in 1883, during three weeks in June and July, when upwards of 2000 specimens were obtained, including several rare

and interesting species. Mr. Southey brought a box of Lepidoptera, among which was a *Deiopeia pulchella* from Southend, in Essex. Mr. Payne showed a box of Geometræ. Much attention was given to some photographs and remarks upon the Lepidoptera of Hudson's Bay by Mr. Walton Haydon, who had just returned, after a residence there of upwards of five and a half years.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—Although the season has been greatly decried by collectors of Lepidoptera, yet the good selection of insects shown at the Pocket-box Exhibition, held by the above Society on the 15th November last, proves that, although species were undoubtedly scarce, yet there are many earnest and persevering workers in the neighbourhood of London. Limited as the show was to this year's taking, it must have been a pleasant surprise to any visitor, having a knowledge of Entomology, to observe the number of species present usually considered as "good things." The habit of order and neatness, so necessary to the entomologist, was very observable in many of the boxes exhibited, those of Mr. Charles Boden being especially worthy of mention, including as they did many of the Tortrices and Tinea. His *Sesiæ* were beyond praise, both for setting and condition, a long row of both *Sesia chrysidiformis* and of *S. cynipiformis* figuring prominently; his *S. chrysidiformis* bred from dock being larger than those from sorrel. Among his Tortrices I noticed *Mixodia bourchardana*, *Chrosis audouinana*, *Coccyx pygmæana*, and *Ephippiphora nigricostana*. Among the Crambites, *Phycis adornatella*, *P. subornatella*, *P. carbonariella*, and *Pempelia palumbella*. Among the Tinea, *Solenobia inconspicua*, *Coleophora inflatella*, and *Tinea bistrigella*. The box shown by Mr. J. A. Cooper contained several good species and rarities; two dark *Stauropus fagi*; three of that favourite of variety-breeders, viz., *Arctia caja*, one of which was very dark and suffused, and one black *repandata*. His *Melitæa artemis*, fed upon honeysuckle, were of large size, and claimed a large share of admiration; as did also the very fine *Angerona prunaria*, exhibited by Mr. T. Hockett, who also showed some exceptionally large *Saturnia carpinii* and *Liparis dispar*. Among the noticeable varieties was that of *Polyommatus phlæas*, taken on the wing by Mr. J. Lusby, at High Beech, in which the usual zigzag series of black spots on the fore wing were grouped in the centre of the disk. Among the rarities may be numbered *Xylina conformis*,

shown by Messrs. T. Cooke & Son, who also exhibited *sparganii* from the Dover district, and a varied series of *Acronycta alni*. Mr. E. Upton showed *Boletobia fuliginaria*, which he had bred during the year; and some more of the same species, larger but not so dark, were shown by Mr. J. A. Clark. The latter gentleman's exhibit was very extensive, comprising among other good species a peculiar variety of *Tæniocampa gothica*, some well-marked *Platypteryx falcata*, three species of clear-wing, viz., *S. ichneumoniformis*, *S. cynipiformis*, and *S. culiciformis*; and a very fine captured *Deilephila lineata*. Some peculiar varieties of *Arctia caja* were exhibited by Mr. O. C. Goldthwaite, and a long row of *Diphthera orion*, some of which had remained in the pupa state two years. Some very dark *Ypsipetes impluviata*, large *Coremia propugnata*, and varied *Melanippe hastata* were seen in Mr. Harper's box; and some striking varieties of *Vanessa atalanta* and *V. cardui* in that of Mr. Geo. Muncer. Mr. D. Pratt had evidently been repaid for working the sallows by an extraordinary form of *Tæniocampa munda*; he had also obtained during the season *Nyssia hispidaria* and *Geometra smaragdaria*. Some *Notodonta trepida*, bred from eggs from Epping, were also on view. Also a fine variety of *Diclya oo*, taken in Epping Forest, by Mr. H. Jobson. Also *M. hastata* and *Cucullia lychnitis*. Among the preserved larvæ exhibited were those of *N. zonaria* and *T. opima*, by Mr. J. M. Raine and Mr. H. C. Schooling. Mr. G. Clark, of Rannoch, exhibited a long row of that very northern species *Crymodes exulis*, among which were only two of the lighter variety. Mr. J. W. Russell and many other gentlemen also exhibited Lepidoptera of more or less value. Nor were the Coleoptera wanting in representatives, for the large case exhibited by Mr. H. Cripps contained many good species, as did also that of Mr. G. A. Lewcock, among which were noticeable *Malachius ruficollis*, *Anthocomus fasciata*, and *Donacia sagittariæ*, &c.—R. G. BARRY, Sec.

BOURNEMOUTH SOCIETY OF NATURAL SCIENCE. — At the Conversazione, held by the above Society in the Bournemouth Town Hall, on November 7th, among the various exhibits was a collection of Arachnida, and illustrations of the anatomy of Lepidoptera, and of specimens from other branches of Entomology.—J. T. C.

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INFLUENCE OF METEOROLOGICAL CONDITIONS UPON LEPIDOPTERA.

BY W. F. DE V. KANE.

IN Entom. XVI., p. 265, Mr. South refers to the difficult question of the influence of meteorological conditions upon Lepidoptera. I heartily concur with him in thinking it of the highest interest, and regret to find that so few entomologists seem to give their attention to the subject. The influence which electrical phenomena exert upon the breeding and life-history of this delicate order of insects is a part of the enquiry which might be pursued with much advantage.

Those who breed the larvæ of delicate insects might well make observations in this direction. For my own part, however, I confess my belief that the subtle agency of electricity has only an important bearing on the subject in its secondary results, that is in the production of violent rains, storms, and heat. There can be no question that the electric fluid is largely responsible for the general meteorological conditions, and thus affects all living creatures; but until it has been shown to have not only immediate, but permanent, effects upon animal organisms, apart from the atmospheric disturbances produced by it, I doubt whether it can be ranked as a potent factor in the determination of the question.

That insects display great activity before a thunderstorm is, as Mr. South says, an interesting phenomenon, but may be well accounted for by the rise of temperature and heavy moist

condition of the atmosphere, very similar to the conditions which prevail on a good night for "sugaring." No doubt all living things are more or less affected for the time being by electrical influences, as well as by every change of the weather. Anglers are well aware of this. In Best's 'Art of Angling' there is a "Prognostic of Weather," which is pithy, amusing, and has, I fear, a reflex bearing upon the habits of anglers of that day, as much as upon those of the familiar insect referred to. It is this:—"Against rain, fleas bite more than common." I am inclined to think, therefore, that the electric fluid affects all living things very much as any other change of weather, and is transient, except in its secondary results.

I cannot help regretting, as I have done in a former communication on the subject, that a valuable source of knowledge is neglected by the comparative scarcity of brethren of the net in Ireland; for in the dissimilar meteorological conditions of the two islands we have a basis to go upon of considerable value in determination of questions of this very kind.

Here, in Ireland, thunderstorms very rarely occur, and when they do are of slight importance compared with the violence they develop in the sister country. The remarkable divergence, which is frequently observable in the character of the seasons on each side of the Irish Sea, is equally valuable as a diagnostic. Mr. South's suggestion that entomologists should keep a rough meteorological diary is a most valuable one; for again this year the dissimilarity to which I refer to has been remarkable.

The London Meteorological Office has characterised the past summer in England as remarkably dry, "Dryer," they say, "than any since the year 1869;" while the rainfall in Ireland, throughout almost the whole course of the summer, has been "excessive," though towards the autumn more favourable weather has been enjoyed.

Now if next year any considerable divergence as to the abundance of imagines, whose larvæ were bred this summer, is observed in the two countries, we may fairly found a conclusion on the premises. The summary of meteorological statistics issued by the London office seems to be of much importance to those who are interested in this whole subject.

I know that in England the season of 1878 was an excellent one for entomologists; but of the character of the preceding ones

I am ignorant, having passed them on the Continent. But since that year it cannot be said that a single season has been prolific. Now the meteorologist's record that every summer since 1879 has been notably deficient in heat, so that we have had five cool summers in succession; while those of the years 1874—78, inclusive, were above the average of warmth,—that of 1874 being "warm;" 1875, of normal temperature (though wet); 1876, very warm, inasmuch as there were only fourteen "cool" days (contrasting with fifty-five in that of 1879); while the summer of 1878 was, although somewhat rainy, above the average temperature. In the former period, that is before 1878, the rainfall averaged 5 per cent. in excess; in the latter no less than 18 per cent. above the normal amount.

Now as to the effect the amount of rainfall has upon the larvæ of lepidopterous insects, although I do not dispute it to be perhaps considerable (especially, I am inclined to think, upon day-feeders), yet I hold very strongly that sun heat is necessary, next to food, in promoting health, growth, and, in fact, general vital energy.

While the largest number of lepidopterous insects, either in larval or perfect state, do not object to damp (I refer to the greater portion of nocturnal Heterocera), yet there can be no question that all the Rhopalocera, and nearly all the Heterocera, are powerfully influenced by sunshine or warmth. A damp, nay a wet, night, so long as it is warm, is excellent for entomological research, not only for imagines, but for larvæ. And when one considers the numerous species that thrive in fenny and marshy places, and the abundant lepidopterous fauna occurring in those portions of the British Islands most noted for excessive rainfall, namely, the Lake Districts, South Devon and Cornwall, the South of Ireland and Killarney, the conclusion seems forced upon one that rain and damp of themselves are not prejudicial to by far the greatest section of the order of Lepidoptera. The damp heat of the Tropics seems to be entirely congenial, whilst the damp, but cold, climates of the world, on the other hand, seem almost devoid of this description of insect-life.

It is, of course, needless to offer any proof of the magical power of sun heat on these beautiful creatures; but a remarkable illustration of it once occurred to me, which I am tempted to adduce. Some few years since I had ascended one of the Swiss

mountains in quest of alpine species, until, reaching the confines of the snow limit, I sat down to eat my sandwich. I had disturbed a butterfly, which looked like *Melitæa artemis*, but, being rather fagged with the steep ascent, I watched it settle on a snow patch close by without giving chase. The sun then becoming suddenly overcast the insect remained like a spot on the snow, until, my lunch ended, I approached, and found it benumbed and almost lifeless. It was a female *M. cynthia*, which differs remarkably from the white-banded male, and approximates closely to *M. artemis* in size and colour, the latter insect, as I might have remembered, not occurring at that height, except in the degenerate form of var. *merope*. I killed the specimen by leaving it a little while built up in snow. Frequently also I have noticed *Rhopaloeera* dead on snow patches, doubtless from the same cause.

In fine I am disposed to think, though storms and unseasonable frosts are very potent causes of scarcity, yet that when we have another cycle of warm summers, no matter what the winters are like, we shall once more rejoice in plentiful entomological harvests. Mr. Dale's motto I heartily adopt, "Floreant Entomologia."

Sloperton Lodge, Kingstown, Co. Dublin, Jan. 8, 1884.

NOTES ON EXOTIC LEPIDOPTERA REARED IN 1883.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société Nationale d'Acclimatation de France.)

FROM the 1st to the 16th of January two *Atlas*, three *Selene* and one hybrid *Roylei-pernyi* moths emerged from cocoons kept, like all the others, in a room without any artificial heat, after which time no moths of any exotic species emerged till May.

Of North-American Bombyces I had an immense quantity of *Cecropia*, *Polyphemus* and *Promethea* cocoons, from the moths of which I obtained thousands of fertile ova. The larvæ of *Cecropia* and *Promethea* were placed on trees in my garden without any protection (which, in fact, could not be given them), the consequence being that they were in course of time destroyed by their

numerous enemies, with the exception of a few *Cecropia*, one of which I found on a currant bush, as late as the 14th of October, in its last stage.

Polyphemus larvæ, reared on small oak trees, were protected by wire and fish-netting, and these magnificent larvæ formed their cocoons on the trees in spite of some heavy rains and unfavourable weather, from the 18th of September to the 7th of October. I only obtained three pairings of this species,—the first on the 20th, the second and third on the 23rd of June. As I stated, in several of my previous reports, it is difficult to obtain the pairing of *Polyphemus* in captivity. Of *Cecropia* I had nineteen pairings, from the 30th of May to the 19th of July; and of *Promethea* eleven or twelve pairings, from the 6th of July to the 14th of August. Many more pairings of these two species could have been obtained if the ova had been wanted. On the 25th of June a male *Cecropia* paired with a female *Polyphemus*; and on the 1st of July a male *Cynthia* paired with a female *Promethea*. I also find that on the 25th of June a male *Cecropia* paired with a female *Polyphemus*. The ova in the three cases were unfertile.

Actias luna.—Of this I had no cocoons, but received ova from France and from three American correspondents. Those from Illinois and Iowa hatched during the voyage, and the larvæ were dead on their arrival, or died shortly afterwards. On the contrary, the ova received from New York, in consequence of the much shorter distance, gave a rather satisfactory result. Many of the larvæ from these ova (the number of which was enormous) hatched during the voyage, lived, and thrived. These ova and young larvæ arrived here on the 28th of July, and the small number I had time to rear pupated about the middle of September.

Hyperchiria io.—With about fifty moths, from cocoons sent me from New York, which emerged from the 2nd of June to the 1st of July, I obtained fourteen pairings, which I consider a great success, as some of the moths were preserved for the cabinet. Some of the larvæ, bred on willows in the garden, had not yet pupated on the 15th of October.

Ceratocampa (Eacles) imperialis.—With fifteen pupæ only one moth emerged on the 1st of July; it was a fine male specimen. The moths in the other pupæ I found, later on, dried up, but perfectly well developed. I attribute the loss of these moths to

the sudden change of temperature just at the time they were about to emerge from the pupæ. On the 24th of July I received from Illinois fifty eggs of *C. imperialis*. These hatched the very day they arrived, and the following; but, although they were very active and looked healthy, they all died within a few days. My American correspondent was equally unsuccessful with the rearing of larvæ of the same brood. On referring to my article in the 'Entomologist,' on the rearings of 1881, it will be seen that I was very successful that year rearing the larvæ through all their six stages. I had that year artificial heat to force the moths out of the pupæ, the temperature being from 20° to 25°, sometimes 28°, centigrades.

Dryocampa (Anisota) rubicunda.—With a quantity of pupæ of this species I was unsuccessful also, obtaining one moth only on the 1st of June, the remaining pupæ having dried up.

Orgyia leucostigma.—Ova of this interesting little species I received from Iowa during the winter or early spring. The larvæ I bred most successfully, so did several British and continental entomologists. The larvæ began to hatch on the 12th of June, and the first moth appeared on the 5th of August. I bred a large number of the larvæ under glass; some were placed on trees in the garden for their acclimatisation, with what result we may perhaps learn next year.

Hemaris tenuis.—I had this year fourteen pupæ of a little sphinx sent to me as being *H. tenuis*, but which Mr. Kirby identified as being *H. diffinis*. Eight moths were obtained from these pupæ from the 7th to the 18th of June, but, in spite of all my contrivances, I could not obtain a single pairing. Only two eggs were found, which did not hatch.

Apatura clyton.—Larvæ of this species were sent to me from Illinois, and I received them in their dormant state on the 28th of March. They were fastened in groups to dried leaves of the *Celtis occidentalis*, commonly called the nettle tree, on account of its leaves resembling those of the tall or stinging nettle, *Urtica urens*. Most of the larvæ were on the under surface of the leaves, and there were about five or six dozens of them. Shortly after their arrival (I did not take notice of the exact date) these little larvæ commenced to come out of their state of lethargy, a few only on the first days; and in the course of two or three weeks all were alive. The difficulty, as soon as they had begun waking

up, was how to feed them. I had no *Celtis* of any species; and on a visit to Kew Gardens I found that the *Celtis* of all species could not break into leaf for about a fortnight. Some branches of an American maple with small foliage, grown under glass, were then given to me, and I tried this as a substitute, with twigs of other trees just coming out into foliage in the open air, such as elm, hornbeam, &c. Although the larvæ did eat a little, their progress seemed very slow; and a number of them died or escaped from under the glass which covered them. At last I obtained, from the magnificent nursery grounds of Mrs. Veitch & Sons, near Coombe Wood, five little trees of *Celtis orientalis*, which were all put for me into one pot. After carefully examining all the leaves on which the little larvæ had been placed, I only found two alive and in good condition. These were at once placed on the buds of the *Celtis*, which were just beginning to break, and from that time I had no more trouble with the larvæ; they never moved from the buds or leaves, to which they were firmly fixed with a few silk threads, always on the under surface of the leaves. I could not observe them except at the risk of injuring them, so I left them undisturbed; they seemed to eat only at night-time. It was only when the larvæ had reached their last stage that they could more easily be observed; they could then be seen eating in the daytime, but not so much as at night-time. Just about the time of this transformation (and this will give an idea of the size of the twigs which I called trees) all the foliage had disappeared, excepting a few leaves. I was then uneasy about the larvæ, when the first larva began its transformation on the 3rd of July, turning into a beautiful light green pupa on the 5th. The larva, when full grown, is about two inches in length. The transformation of the second larva commenced on the 8th of July, lasting the same time as the first. The first butterfly emerged on the 25th of July, and the second on the 31st. The following is the rough description of the larva in its last stage:—Body apparently green, but all covered with small yellow spots; slug-shaped, with bifid tail, like *Apatura iris*; face white; horns yellow at top, and light yellow on the sides; two white longitudinal stripes on the back, separated by a dark green line extending from the head to the tail; two other light yellow lines on the sides. Both butterflies happened to be females, which are deprived of the bright

metallic reflection of the male. The fore wings are orange-brown, with black markings and whitish spots; the hind wings very dark, almost black, except at the base, where they are suffused with brown; near the margin on the inner side a row of eye-like spots, round which on the outer side are five or six smaller spots, orange-brown; the eye-like spots are hardly visible on one of the two specimens. I have omitted to say that the larvæ were bred in the house.

Limenitis disippus.—This species I tried to rear in the open on willow. The larvæ for several weeks thrived very well during the spring, but they were ultimately destroyed by their enemies. Had I protected them with a muslin-bag, or bred them on a tree in the house, the rearing would have been very easy. I bred this species before, and I think it could be bred successfully in the open if the larvæ were protected from ants, wasps, and other pests.

The *Limenitis disippus* larvæ were sent to me from Iowa during the winter or early spring, and they were placed in the spring on the willows. I watched them coming out of their little willow-leaf cases when the sun was shining, and going in again after sunset.

Darapsa myron.—In April or May my little daughter found, in one of the flower-beds adjoining the house, on the surface of the ground, a pupa which I could not recognise, except as being a species of the Sphingidæ. It seemed to me a pupa of some *Deilephila*. About the middle of July a moth emerged from it unknown to me, and to other persons to whom I showed it. The colours were somewhat like those of *Smerinthus tiliæ*, but the shape was entirely different. Could it have been a natural hybrid between *S. tiliæ* and some *Deilephila*? This was hardly possible. What could it be? The pupa evidently was the produce of a larva which had fed in the garden. It was found at the foot of a jessamine, but, besides this, other climbers cover the house,—vine, honeysuckle, rose, Virginia-creeper, and ivy. I took the specimen, with its pupa-case, to the British Museum, to have the species identified by Mr. Kirby, and he found it to be *Derapsa myron*, a North-American species. Should any other specimens of this species have been captured it will be most interesting to know, and how it found its way to England. The following is the description:—Pupa light brown, speckled with black; coverings

of the head and thorax darker, speckled with black, and pale lines beneath; incisions of abdomen reddish brown; spiracles black. Moth:—Body and fore wings green; sides of the thorax with a pale stripe; fore wings varied with paler and darker green, with a dark green central dot, and with two transverse whitish lines, the inner one angulated, and edged outside with dark green; hind wings dull reddish orange, and angle greenish.

(To be continued.)

NOTES ON THE PAST SEASON; WITH CAPTURES IN WEST NORFOLK.

(Concluded.)

BY EDWARD A. ATMORE.

AT the end of July and beginning of August I took a long series of *Orthotania ericetana*, a species which, I believe, is seldom met with in such numbers. Its head-quarters appeared to be a field, which, not having been cultivated for the last year or two, was thickly over-grown with common low plants; from observations made, whilst boxing some of the specimens, I think that its larva would probably feed there in the stems and roots of *Mentha arvensis* or *Matricaria inodora*, perhaps both. Amongst the Tineæ taken during July I note *Gelechia anthyllidella*, *G. rufescentella*, *G. ligulella*, *Sophronia parenthesesella*, and *Opostega salaciella*, all of which were taken by sweeping low herbage on heathy places. At the end of the month and beginning of next (August) our alders contributed a fair share of species worth boxing, such as *Gracillaria elongella*, which was of frequent occurrence, and *Strathmopoda pedella*, which was plentiful but very local, being confined to a few of the older trees only; the latter species is easily dislodged from the branches by tapping, and when in the net is a quaint-looking insect, reminding me most forcibly of a Coleopteron. From the same trees, which produced *S. pedella*, a fine series of nearly three dozen *Bohemannia quadrimaculella* was obtained: this little gem seems very much akin in its habits to the Nepticulidæ, and certainly prefers sunny weather for its flight. On the heath, some two or three hundred yards from the spot where the three last-mentioned species were

taken, *Cleodora cytisella* was no rarity, although it must be considered here, as I suppose it is in most places, a very local species. All my specimens were taken among common brakes (*Pteris aquilina*), which, I believe, is reputed to be the probable food-plant of its larva. A large tract of the surrounding country seemed similar in every particular, but *C. cytisella* was only noticed on a few square yards of ground.

Early in August *Gonepteryx rhamni* was observed wherever alder-buckthorn (*Rhamnus frangula*) flourished; the other buckthorn (*R. catharticus*) I have not noticed within a radius of some ten or more miles. Towards the end of the month a few fresh *Vanessa cardui* were seen; and during September this butterfly was common in clover-fields. *Plusia gamma* now became very noticeable, its abundance being strikingly apparent on heaths, where scarcely a step could be taken without disturbing one or more specimens; now and then one, with what I fancied to be rather a different flight from its brethren, succeeded in tempting me into a pursuit, to end of course in disappointment and chagrin upon discovering that I had nothing more than a deceptive *P. gamma* in the net. About the middle of the month (September), whilst searching heather by night for larvæ of *Anarta myrtilli*, *Agrotis porphyrea*, *Eupithecia nanata*, and *E. minutata*, all of which were common, a few *Thera firmata* were captured at rest on the blossoms; but it was not an easy matter to select this species from among the much more numerous *T. variata* and *Cidaria testata*. At the same time I chanced to find *A. agathina* feasting on the blossoms of ling (*Calluna vulgaris*), but being late in the season for it only two or three specimens worth boxing and setting could be found; had the species been noticed a little earlier no doubt a fine series would have resulted.

Finding now that imagines, which would repay the trouble of collecting, were scarce (not that there was any paucity of common Lepidoptera), I turned my attention, by way of a change, to searching for larvæ, which mode of collecting certainly proved more remunerative. Amongst those found I note the following:—*Clostera reclusa* very common, with an occasional *Notodonta ziczac* and *Smerinthus ocellatus* on dwarf-sallow (*Salix repens*); *Peronea hastiana* in the tops, and mines of *Lithocolletis quinqueguttella* in leaves of the same; *Ypsipetes impluviata*, *Eupisteria*

heparata, and *Notodonta dromedarius* obtained by beating and searching alders; *Platypteryx falcula* not uncommon on leaves of alder, and most generally found in a silken web on the upper surface; mines of *Lithocolletis stettinella* also in leaves of alder; *Ephyra pendularia* on birch; some *Eupitheciæ* on seeds of *Angelica sylvestris*, &c. In the green fruits of alder were also obtained larvæ, of what there is every reason to believe will produce imagines of *Strathmopoda pedella*; and I noted that the lower fruits on the tree were mostly free from larvæ; but feeling sure that the larvæ must be somewhere on the trees which yielded the imagines so plentifully, a climb was resorted to, resulting in a good supply; and the higher one climbed the more larvæ could be obtained. To mention other larvæ met with would take too much space.

Several visits were made to ivy-bloom during October, but I have no remarkable captures to record therefrom. Certainly the usual common visitors to this attraction were well represented, such as *Xanthia ferruginea*, *Miselia oxyacanthæ*, *Phlogophora meticulosa*, *Noctua c-nigrum*, &c., with here and there an odd *Orthosia lota*, *O. macilenta*, *Anchocelis pistacina*, and *A. lunosa*. A few species, among which were *Himera pennaria*, *Pœcilocampa populi*, *Hibernia defoliaria*, and *Petasia cassinea*, came to light at the end of October and beginning of November; whilst *Calocampa exoleta* visited sugar. With these I close my list.

Finally, having read in your columns so many accounts of the unsatisfactory nature of the season in different parts of the country, I venture to think that my list of captures in this locality, for the year 1883, will prove satisfactory.

3, Haylett Terrace, Exton's Road, King's Lynn, Dec. 21, 1883.

LEPIDOPTERA AT ABBOT'S WOOD AND EASTBOURNE IN 1883.

BY THE REV. CHAS. F. THORNEWILL.

ON July 2nd of last year I started for an insect-hunting excursion to Abbot's Wood, and took up my quarters at the "George Hotel," Hailsham, where I was joined the following day by the Rev. E. C. Dobree Fox; and having visited the

locality in 1881 and reaped a rich harvest of specimens I hoped to repeat my former pleasant experiences.

A few days' work, however, proved that my hopes were doomed to disappointment, and I can fully confirm the reports which have appeared from so many other collectors as to the unproductiveness of the season, for I found that "sugar" was utterly useless; and, although we persevered during the greater portion of our visit, the only good insects that we took from it were a couple of *Nola strigula* (of which I got forty in one night in 1881), and a similar number of *Cymatophora* or.

A still more ominous feature was the entire absence of larvæ. I used the beating-stick pretty freely for the first week, but with absolutely no result, and after that "accepted the inevitable." Trunk-searching, likewise, proved a failure, the only insect found in this way, except *Eudoreæ*, being a dark and well-marked *Cleora lichenaria*.

Butterflies were by no means common, with the exception of *Hesperia sylvanus*, which swarmed in the lanes and rides of the wood. We got a fair series of *Melitæa athalia* by dint of diligent working, but *Argynnis paphia* was very scarce; *A. adippe* never made its appearance at all, and even *Arge galathea* was by no means abundant.

The most productive plan of working proved to be "nothing" at dusk; and in this way we got a couple of *Cymatophora fluctuosa*, a goodly number of *Calligenia miniata*, and a perfect plethora of *Phorodesma bajularia*, the last-named insect flying in abundance just after sunset, but requiring some little agility to capture it, as it swiftly passed across from one oak tree to another. *Hemithea thymiaria*, too, proved a perfect pest a little later in the evening; and several fine varieties of *Angerona prunaria* fell to the lot of my companion, my captures unfortunately being confined to the common orange form.

Growing tired of our ill-success in the wood we determined to make for the sea, and during the latter part of our stay made numerous visits to Eastbourne and Beachy Head, with rather better results. There *A. aglaia* occurred, though not in great profusion, at the top of the cliffs below the coast-guard station, but was not easy to capture, as it frequented a decidedly dangerous spot, and our specimens were secured at the risk of our necks. We also found *Lycæna corydon* flying pretty freely lower down, and the

bright-tinted *Zygæna filipendulæ* was to be seen in all directions, while *Macroglossa stellatarum* now and then paid a brief visit, sometimes, but not always, darting off unharmed. One specimen only of *Odontia dentalis* turned up, but *Stenia punctalis* proved fairly abundant, especially in an old quarry near the Convalescent Hospital, where we also obtained a large number of *Acidalia interjectaria*. *Botys flavalis* appeared only a few days before we left, but seemed to be pretty common a little to the east of the coast-guard station, where also *Pyrausta ostrinalis* abounded in fine condition; and, a little nearer to the cliffs, the same remark will apply to *Herbula cespitalis*. In fact, it was amongst the Pyralides and Deltoides, on the whole, that we fared best, as, in addition to those already named, we took at Abbot's Wood good series of *Endotricha flammealis*, *Ebulea crocealis*, and *Rivula sericealis*, with a few specimens of *Herminia derivalis*, *Hypenodes albistrigalis*, and *Pionea stramentalis*; and a couple of Mr. Barrett's new addition to our list, *E. stachydalis*.

Mr. Fox had arranged to leave on the 19th, and, as we were doing so little, I returned at the same time, though I had originally intended to remain for another week; and I am afraid that the results of our visit will appear somewhat meagre; but the season was undeniably a bad one, and only a large amount of sheer hard work would have availed to obtain even what we did. Still, on the whole, I am by no means dissatisfied with my southern trip in 1883.

The Soho, Burton-on-Trent, January 3, 1884.

BIRDS IN RELATION TO LEPIDOPTERA.

BY FRED. W. FROHAWK.

THE question of the scarcity of Lepidoptera has engaged the attention of collectors for some time past, and to account for such scarcity many good reasons have been put forward.

One of the principal causes of such scarcity, not only among Lepidoptera, but among insects in general, I quite think is due to the greatly increasing numbers of one of their greatest enemies, *viz.*, birds, the country now in most parts abounding

with them. In every wood and hedgerow may be seen numerous insectivorous birds, and many of these, although comparatively small, destroy an immense number of insects in comparison to their size. The enormous quantity of insects destroyed by a single pair of blue titmice during the breeding season is well shown in that excellent work the 'Birds of Norfolk,' by Mr. Henry Stevenson, in which it is stated, on trustworthy authority, that a pair, which were closely watched from half-past three o'clock on a July morning until half-past eight in the evening, fed their young four hundred and seventy-five times. It is also stated that they appeared to feed them solely on caterpillars: sometimes they brought in a single large one, and at other times two or three small ones; and it is therefore impossible to say to what exact numbers their depredations extended. The above note, therefore, gives a good idea of the great destruction caused by those very common little birds.

In August I shot a goatsucker hawking for food, and from its mouth I took no less than a dozen various Noctuæ, just caught, no doubt, for its young. This bird feeds almost entirely on night-flying moths and beetles, taken on the wing during the two dusk hours in which they fly,—before sunrise and after sunset. The number of imagines thus destroyed must be very great.

Certainly since the Wild Birds' Protection Act has been in force birds of all kinds, especially the smaller sorts, as warblers and titmice, which feed principally on insects,—also the finches, which do their share at times,—have very greatly increased, and therefore it is obvious that insects must decrease; and during such mild winters as last, when no doubt most hibernating larvæ are frequently on the move, and therefore more conspicuous, would sooner become prey than if they remained quiet and hidden. I have seen flocks of golden-crested wrens (the smallest of European birds, and now extremely common), often in company with a flock of long-tailed titmice, together working a hedge in the winter for any morsel of insect-food they may happen to come across, and scarcely a branch or twig is passed without receiving a due share of their notice, and usually something found. During such a mild and open winter as last, birds survive and insects perish; and not only are birds enemies of insects in such winters, but mice are on the alert to devour any pupæ with which they may chance to meet.

It will thus be seen that birds exert a far greater influence upon Lepidoptera than is supposed at first thought; and although these remarks are but brief, yet they may lead to the expression of more general opinions on the point.

Upper Norwood, December 15, 1883.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

IRREGULAR EMERGENCE OF LEPIDOPTERA.—Last year I was much surprised by the appearance of a specimen of *Acronycta tridens* in my breeding-cage towards the end of October, resulting from a larva obtained in the autumn of 1881. As members of the genus *Acronycta* are irregular in their appearance I did not take much notice of it at the time; but, as another specimen of *A. tridens* put in an appearance on the 13th of November this year (1883), I am inclined to enquire whether other entomologists, who are in the habit of breeding this species, have found specimens emerge so late in the season. My pupæ were kept in a room where there is always a fire, so that the emergence is more intelligible than the breeding of four specimens of *Platypteryx unguicula*,—three by my friend Mr. Harold Archer, of Ely, on the 8th and 10th of November; the other by myself, on the 8th of this month (December): both resulting from pupæ kept in fireless rooms, and the produce of larvæ which hatched from eggs obtained in May, and pupated towards the end of July. Of the pupæ thus obtained only some ten per cent. emerged in August, and the remainder are lying over till next season.—GILBERT H. RAYNOR; Hereward Hall, Ely, December 10, 1883.

SUSSEX LEPIDOPTERA-RHOPALOCERA.—In the December number of the 'Entomologist's Monthly Magazine,' p. 164, a list is given of the butterflies of Huntingdonshire, by Mr. Herbert E. Norris. It appears that during the years 1882–83 forty-two species were taken in that county, and the remark is made that "we must not forget that this county was the home of *P. hippothöe* and *P. machaon*, and that *P. machaon* was abundant in the fens, making a grand total of 48? (44) different species. This is a large proportion out of the 62 British species,

some of which are really unattainable." Mr. Norris also observes that he does not know where else such variety could be obtained in one shire. I think that my native county, Sussex, compares more favourably than Huntingdonshire with any other county, unless perhaps Kent, in this respect. Doubleday's 'List of British Lepidoptera' gives the names of 65 species of Rhopalocera; of these 55 have been taken in Sussex, viz.:—*Papilio*, 1; *Pieris*, 5; *Anthocharis*, 1; *Leucophasia*, 1; *Gonepteryx*, 1; *Colias*, 2; *Thecla*, 4, being all but *T. pruni*; *Chrysophanus*, 1, viz. *C. phlæas*; *Lycæna*, 8, being all but *L. arion* and *L. artaxerxes*; *Nemeobius*, 1; *Limenitis*, 1; *Argynnis*, 6; *Melitæa*, 2, excluding *M. cinxia*; *Vanessa*, 7; *Apatura*, 1; *Arge*, 1; *Satyrus*, 7, being all but *S. davus*; *Pamphila*, 3, excluding *P. actæon*; *Syrichthus*, 1; *Thanaos*, 1. To these may be added the rare *Lycæna bætica*, which may be indigenous, and has been taken in the county; and the American species, *Danaïs archippus*, which has twice occurred, viz., once at Lindfield and once at Keymer: making altogether a total of 57 species of butterflies which have been taken in Sussex.—J. JENNER WEIR; Beckenham, Kent, January 1, 1884.

LOCALITIES OF DIURNI.—I am compiling a list of Huntingdonshire Lepidoptera, and shall be glad if those entomologists who have resided in, or visited, the county will forward me a list of their authentic captures. I have prepared a map of the British Isles, showing the geographical distribution of Rhopalocera in the various counties; but I find that many of the captures are rather of an old date. I should, therefore, feel obliged if collectors would furnish me with a list of their captures of butterflies in their own counties, the nomenclature and numbering being the same as Meek's list. The list to contain only those species captured since 1875 inclusive, which will be a period of eight years. If several friends send from the same county it will be an advantage, as the lists can be compared. By this means I hope to be able to ascertain the number of species of butterflies in each county at the present time, and also the number of counties an insect is distributed over. This will be extremely interesting, as the area frequented by butterflies has in some cases diminished, as in the case of *Papilio machaon*; and the systematic collection of details to show their local distribution is still a desideratum. Remarks may be made on lists relating to their rarity or commonness. By the kind permission of the

Editors the receipt of lists will be acknowledged in the exchange column. Botanists have their census, and ornithologists publish their lists; Why should not we, therefore, know the distribution accurately of our butterflies? Probably even more important results may be derived as to the cause of certain kinds of distribution; and to this end I hope that entomologists will take the matter up heartily and promptly.—HERBERT E. NORRIS; St. Ives, Hunts, December 7, 1883.

COLIAS EDUSA.—The following notices of the occurrence of the above species have been sent for publication, *viz.*:—At Croydon, during September, by Mr. W. M. Geldart; also var. *helice*. By Mr. D. Chittenden, at Hythe, two specimens during the same month. The latter gentleman also records the occurrence of *Acherontia atropos* on the 9th of June.—J. T. C.

COLIAS EDUSA IN SWITZERLAND.—Having seen several notices lately in the 'Entomologist' about the occasional occurrence of *Colias edusa* in England, I should like to mention that while I was in Switzerland, in September, 1883, that species was the commonest butterfly to be seen; it greatly exceeded even the *Pieridæ* in numbers, and I could have taken many hundreds. On September 13th, shortly after leaving Chamounix, and climbing to a height of 1000 feet, I came across several specimens of *Erebia blandina*. A few days before a friend presented me with *Argynnis lathonia* in fair condition, which he had taken near Lausanne. On the 16th, while walking to Aosta, in the North of Italy, I met with *C. hyale* and several blues; also *Melitæa cinxia*, *A. aglaia*, and *Satyrus janira*. On the 17th I saw the beautiful *Doritis apollo* on the wing, the first time I have ever met with it out of a cabinet; also specimens of *C. hyale* and *S. semele*. As I was never out late at night I had no opportunity of observing the moths. It was most interesting to find at the height of 8000 or 9000 feet many signs of insect-life. Here the snow was flecked with small black flies, which were running over the surface in a most lively manner, at the summit of a pass called the Col du Bonhomme.—CHAS. E. M. INCE; 11, St. Stephen's Avenue, Shepherd's Bush, W., December 19, 1883.

VARIETY OF *LYCÆNA ARGIOLOUS*.—On looking over some last year's captures I found a specimen of the above-named, which has the hind wings distinctly angled, in much the same manner

as those of *Gonepteryx rhamni*, except that the angles are not quite so prominent or acute as in the latter insect. In all other respects it seems to agree with the ordinary form of *L. argiolus*. It was taken about the end of May. I have never heard of any similar variation in this insect, and should like to know if such often occurs.—E. B. BISHOP; 3, Primrose Terrace, George Lane, Woodford, January 2, 1884.

FOOD OF GONEPTERYX RHAMNI.—What does *Gonepteryx rhamni* in its larval state feed upon besides buckthorn? I have found the larvæ here on both *Rhamnus catharticus* and *R. frangula*; chiefly the latter, which is common here, though I have never noticed it elsewhere. Surely there must be some other kind of food, as go where you will *G. rhamni* abounds.—C. A. SLADEN; Burghclere, Newbury, November 12, 1883.

REARING OF ATTACUS LUNA.—Referring to my notes on silk-producing insects (Entom. xiv. 85) further experience in rearing *Attacus luna* in the open air induces me to conclude that the incidence of its not passing the winter in the pupal state is entirely due to temperature, as the following will show:—During the past season I was fortunate in obtaining a plentiful supply of ova of this moth from two females impregnated by the same male. The bulk of the ova thus obtained hatched on the 11th and 12th of July, and the young larvæ were fed on walnut (*Juglans regia*), as on the occasion recorded in the notes adverted to. The larvæ passed without mishap through the usual moulting stages of their existence, and constructed cocoons in the early part of the following September, about one month later than previously recorded. The insect is still in the cocoon state, and likely to remain so until next summer, no doubt owing to the pupal transformation having taken place at a more advanced and cooler period of the season.—GEO. J. GRAPES; 2, Pownall Crescent, Colchester, November 29, 1883.

NOCTUA XANTHOGRAPHA.—I strongly suspect that the larvæ observed in such numbers by Mr. Geldart, during February last (Entom. xvi. 277), were those of *Noctua xanthographa*. He mentions that although several larvæ formed cocoons, yet he obtained no pupæ. The larva of *N. xanthographa* forms its cocoon from seven to eight weeks before it turns to a pupa, which causes some difficulty to those who wish to follow it

through its life-history. The best plan to ensure imagines is to let the larvæ form their cocoons in a common flower-pot, and, as soon as they have all gone down, bury the pot up to the rim in the earth, taking care to keep away mice, &c., by covering a piece of wire-gauze over the top. In this manner sufficient moisture will be obtained to prevent the larvæ drying up in their cocoons, which otherwise they will often do.—ALFRED SICH; 25, Branstone Road, Burton-on-Trent, December 20, 1883.

EPUNDA NIGRA AT BOURNEMOUTH.—*E. nigra*, being reckoned one of the “good things” of this neighbourhood, the local collectors look out for it every autumn at sugar; but, like many other “good things,” it does not put in an appearance by any means with regularity. Since 1879 (when I took some four or five dozen) I have not seen a single specimen until this year, when, on the evening of the 2nd October last, I took a fine female off a gas-lamp, which within a week laid a large batch of eggs, from which, on the 13th of this month (November), the young larvæ emerged. I was utterly unprepared to receive them, and, like other “unexpected arrivals,” they had to take pot-luck, which I am sorry to say they took with a very bad grace, for all of them died rather than eat anything I could procure for them at this season of the year. Newman gives *Galium mollugo* as the food-plant, but omits to mention where this can be obtained in the middle of November. Perhaps some entomologist will kindly say what I ought to have done under the circumstances, so that I may be prepared in case of any similar emergency in the future.—W. McRAE; Bournemouth, November 18, 1883.

REARING LARVÆ OF TENIOCAMPA OPIMA.—Last season I received a fine batch of eggs of *T. opima* from Liverpool, from which I obtained a good supply of larvæ, which appeared healthy and did well until about a quarter fed; after which they began to sicken, and each day told of considerable loss, until all were gone, not one having reached the pupal state. They were fed on willow (*Salix caprea*), which was supplied them every other day. It is my intention to make another attempt in the coming season, and I shall be glad of any information as to the best method of constructing an appropriate breeding-cage, and of the treatment of the larvæ. During the past season insects have been exceedingly scarce in this locality, even more so than in

that of 1882. Sugar had no attraction whatever.—THOMAS WALPOLE; 48, Westgate, Grantham, December 13, 1883.

ABUNDANCE OF *EXAPATE GELATELLA*.—Has the excessive abundance of *Exapate gelatella* been noticed in other parts of the country? In the West Riding of Yorkshire, at the end of October and beginning of November, it occurred in profusion. Here it seemed equally at home in all sorts of places,—gardens in the town, fields, palings, woods, &c., all being favoured with its presence. Near Bingley we are told “they arose at every step, and there must have been thousands of them.” In contrast to the scarcity of insects in the summer, autumn species seem to have been plentiful. I took *Dasypolia templi* and *Hybernica aurantiaria* about lamps almost in the town, and the latter has been common on lamps in the outskirts; and I do not remember ever noticing *Cheimatobia brumata* so finely and strongly marked as this year.—GEO. T. PORRITT; Huddersfield, Dec. 1, 1883.

[The last mentioned species, common in Epping Forest in most seasons, has been unusually so in this, and of large size and well marked.—J. T. C.]

LATE WASPS.—The mild and open weather which we have lately experienced, notwithstanding there has been a good deal of rain, has tended to keep insects astir long after their normal time for retiring. There having been no frosts of sufficient severity to kill off the mignonette in the gardens the hive-bees have, up to within a few days of the time I am writing, been doing their best to extract what little honey they could from the blossoms. But I have been more astonished at the number of wasps still about. Early in August I marked two very strong nests of *Vespa vulgaris*, which I expected would be of extra size, and consequently make good cabinet additions. One of these I took on the 16th of last month, but, unfortunately, I did not succeed in getting it out perfect: it was in very rocky ground, and got much crushed. I therefore determined to try the other on another opportunity. This I expected to be the larger of the two, so I kept my eyes on it at short intervals to watch how it went on. It was built in one of those small mounds in a hilly field, which go by the name of ant-hills. The excrescences, whatever they may be, are not solitary mounds, but are strewed thickly over the whole field, and are some sixteen to twenty

inches high, covered over with turf. This nest was built right in the centre of one of these turfy stumps, and I went several times to look at it with the object of taking it, but bided my time, as the sentinels at the entrance were always on the look-out, and showed an evident disposition to drive off not only any intruder, but even anyone who ventured to cast a sly glance at the entrance to their abode, and I ran several chances of being well paid out for peeping. So things went on till the 5th of November, when, armed with a fierce squib, I went prepared to play up Gun-powder Plot with the inhabitants; but I came back without the nest, the wasps being evidently all alive to my intentions, and were not only ready, but appeared anxious, to repel my attack; so, thinking discretion the better part of valour, I returned. I now left home for some days, and did not return till the 15th. The weather just about this time had assumed a wintry look, and we had several very thick white fogs, which hung about the ground all day, and a succession of white hoar frosts; so I concluded that the wasps would have succumbed to these influences. But no! when I walked up on the following morning to take another survey, what was my astonishment to find them working just as though it were summer time, going in and coming out in a constant stream. I did not want to look twice; so returned home, feeling convinced I could leave them while I went away again for a day or two. On the 23rd I came back, and felt I must take it then, or I might not have another opportunity. The weather had been dreadfully wet and stormy, and this morning the frost lay white upon the ground, and the grass was quite crisp under foot; so I started off fully determined to bring the nest home. On reaching the spot I soon saw that the inmates of the nest were still "all alive." There were wasps going out and coming in, but not in such numbers as before; and on looking in I saw that Cerberus was not there. So now was my time; and I set to work and dug away. My only object was to get a good specimen nest, so I took great pains, and succeeded in disclosing a beautiful nest of a creamy white colour, quite perfect, and of very large size. I got it up, and tied it up in my net as quickly as I could; but what with the jogging home over two miles of rough road, and its own weight, it got a good deal damaged; and it still remains in my net suspended; for by the time I put it in the inhabitants had found out what was the matter, and

came crawling out in large numbers with every demonstration of anger; and so they still do every time I look at them.—V. R. PERKINS; Wotton-under-Edge, November 25, 1883.

CRABRO VARIUS, *St. F.*—I had the pleasure of taking a pair of this small Fossor on the 1st of August last, near the Railway Station, Bickley, South Devon. The late Mr. Smith captured specimens in North Devon in 1870; these are the only two recorded captures of this insect in Devon.—G. C. BIGNELL; Stonehouse, January 2, 1884.

MICROMELUS PYRRHOGASTER, *Walk.*—I bred a male and female of this interesting Chalcid from *Mecinus collaris* galls, on the flowering stems of *Plantago maritima*. I have no doubt but that they were parasitic on these small beetles.—G. C. BIGNELL; Stonehouse, Plymouth, December 14, 1883.

NEW BRITISH ICHNEUMON.—I have found, among the insects taken in this neighbourhood during the last summer, a specimen of *Mesoleptus facialis*, Grav. (male). This is a most interesting addition to the British Ichneumons, as it appears not to have been found since Gravenhorst described the single example received from Spinola (*Ichn. Europ. ii. 12*); at least none of the later authors make any mention of it, nor is it in the Rev. T. A. Marshall's Catalogue. The insect is fully six lines in length, being larger than Gravenhorst's, but agrees with his in every other respect; and singular to relate the areolet in the right wing is only faintly indicated, whilst the left has it long petiolated, just as in his specimen; he says, "areola in ala dextra deficiente, in sinistra minutissima triangulari irregulari longepetiolata." It is scarcely right to place it among the *Mesolepti*, for, as Gravenhorst points out, the petiole of the abdomen is distinctly thickened behind, the spiracles being placed somewhat before the middle. The head is transverse, but not buccate. I should say the *Mesolei* was the proper group to place it in. The entirely black body, white face, and ring of antennæ, together with its size, make it very conspicuous and unmistakable.—EDWARD CAPRON; Shiere, Surrey, November 24, 1883.

HEMEROBIUS? OR CHRYSOPA?—Mr. J. E. Fletcher (*Entom. xvii. 22*) is quite right,—I should have put *Chrysopa*, not *Hemerobius*, in my remarks on the abundance of lace-wings; but

as I have no work on Neuroptera, and only knew the insects by their popular name, I adopted Mr. McRae's appellation (Entom. xvi. 235). However, on referring back to Mr. J. J. King's paper (Entom. xv. 28), I found out my mistake. Which does Mr. McRae really mean?—H. E. U. BULL; Foundry Lane, near Southampton, January 2, 1884.

REVIEW.

Catalogue of British Hymenoptera (Aculeata). By EDWARD SAUNDERS, F.L.S. Colchester: W. H. Harwood. 1883.

THIS is a synonymic list of British Aculeate Hymenoptera, brought up to the present time in regard to recently added species and synonymy. The name of Mr. Saunders is a sufficient guarantee for the accuracy of the compilation, and to the enterprise of Mr. W. H. Harwood, of Colchester, in publishing this indispensable list, students of the group are indebted. Although a large number of British entomologists take more than a passing interest in the bees and wasps of this country, the complication of names has been hitherto such a detriment to their successful study that this list will be hailed with gratification. Cannot we persuade Mr. Saunders to add to the present boon a small and handy manual of this section of the Hymenoptera? Such a work would be as great an incentive to workers in this division as was Mr. Stainton's Manual to the Lepidoptera.—J. T. C.

OBITUARY.

WILLIAM BUCKLER.—We regret to announce that Mr. Buckler died on January 9th at Lumley House, Emsworth, Hants, from a short attack of bronchitis, resulting from a slight cold,—caught, we believe, on New Year's Day,—which exhibited no serious symptoms until within two days of his death. Mr. Buckler was in his seventieth year. For the last five and twenty years he had almost entirely devoted his energies to delineating and describing the larvæ of our British Lepidoptera, reared from specimens received from many correspondents. The descriptions have

appeared from time to time in the pages of the 'Entomologist's Monthly Magazine,' but the magnificent drawings remain to be published, every larva described being most carefully and beautifully figured. The 'Intelligencer' contains a few short notes contributed by Mr. Buckler; but it is with the Ent. Mo. Mag. that he has been most intimately connected. Its first volume (1864—5) contained from his pen descriptions of the larvæ of six species of *Lithosia*, of *Leucania comma*, and of *Xylophasia scolopacina*; with notes on the larvæ of *Leucania littoralis* and *Cara-drina cubicularis*. Not one of the twenty volumes has been without numerous life-histories from the pen of Mr. Buckler and his colleague the Rev. John Hellins, the current volume containing the descriptions of the larvæ of *Procris globulariæ*, *Zygæna exulans*, *Endromis versicolor*, *Meliana flammea*, *Bankia argentula* (*bankiana*), and *Apamea fibrosa*; this last written on December 3rd, and published in the January number. It was only last September that Mr. Buckler wrote:—"After investigating the life-histories of our Macro-Lepidoptera, and figuring their larvæ, since 1858, I have amassed more or less satisfactory notes and figures of about 850 species, beginning with the Diurni and ending with the Crambites. Hitherto my friends have been able to supply me with British examples, but it will be evident, from the numbers given above, that the time has come when there arises a yearly-increasing difficulty in obtaining ova or larvæ of the (comparatively) few species yet untouched; whilst the old adage '*ars longa vita brevis*' remains as true as ever; therefore it is, that in view of these pressing reasons, and after consulting the friends whose opinion I most rely on, I have, after some little hesitation, resolved to avail myself of continental aid. This resolve does not lessen my desire to take my notes and figures in all possible cases from indigenous examples; in every case, as before, I shall make a point of stating exactly and truthfully the source from whence my information is derived, so that there will be, I trust, no ground for complaint that I have ever attempted mystification, or added to the difficulties of the naturalists who take in hand the onerous and responsible task of settling the extent of our native fauna." Alas! how soon does the quoted adage apply to the gifted historian of our British Lepidoptera.—E. A. F.

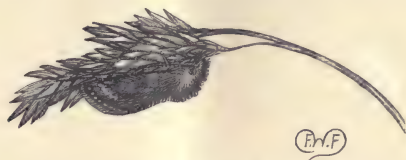
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SLEEPING POSITION OF *THANAOS TAGES*.



THANAOS TAGES.

ON the evening of June 12th last, when searching for *Lycæna medon* and *L. icarus*, of which I found several at rest on the heads of grasses, I noticed one grass head which seemed rather weighty, with what I at first took to be some kind of *Noctua* at rest; but, on closer examination, found it to be *Thanaos tages* at rest. The wings were held in exactly the same position as a *Noctua* when resting. The anterior wings entirely covered the posterior wings, the head bowed so as to touch the grass, and antennæ bent back parallel with the costal margin of the wings. The colours of both butterfly and grass-head upon which it rested were of wonderful similarity; and, coupled with the position taken up on the brown tuft, was a remarkable and perfect disguise.

Having my sketch-book with me at the time I was able to make a sketch of it on the spot, from which the above drawing was made.

FRED. W. FROHAWK.

Haddon, Upper Norwood, S.E., Feb. 5, 1884.

[We have to thank Mr. Frohawk for the above drawing on wood, which we have pleasure in presenting to our readers on his behalf.]

ENTOM.—MARCH, 1884.

H

FURTHER NOTES ON THE LEPIDOPTERA-RHOPALOCERA
OF HUDSON'S BAY.

BY J. JENNER WEIR, F.L.S., F.Z.S.

IN the 'Entomologist' for 1881, vol. xiv., pp. 97—100, will be found my previous communication on this subject. Mr. Walton Haydon, to whose great kindness I am indebted for the collection, has now left the district, and returned to England; at present he has no intention of again visiting Moose, where most of his captures were made, so that this will probably be my last notes on the Lepidoptera of Hudson's Bay. Mr. Haydon was five years and a half stationed at Moose, and as during the whole of the time he was on the alert to capture species new to the district, it may fairly be considered that, with the additions I now make to my former list, a very fair knowledge of the Lepidoptera-Rhopalocera of the southern arm of Hudson's Bay has been obtained.

In my previous paper I gave an account of seventeen species, being all that had been obtained in two years; three more summers' collecting have doubled this number. In my former list I gave the names of three British species of butterflies from Moose, and am now enabled to give three more, *viz.*:—

Cænonympha tiphon, Rott., var. *inornata*, Edw.—But few of these were taken; they are like the British *C. davus*, but even less marked with ocelli; indeed, on the upper side of the wings of two specimens I cannot discover any markings.

Lycæna phlæas, Linn., var. *americana*, D'Urban. — The wings of this variety are suffused with black, and but very faint traces of orange are visible; both sexes are as dark in colour as the males of *L. doris*.

Pieris rapæ, Linn.—No doubt introduced; at present rare.

The following six species are more or less closely allied to British, *viz.*:—

Argynnis aphrodite, Fab.?—I am not quite certain that the three specimens taken are this species; they are much smaller than those figured by Edwards (Butt. N. Amer. Arg. t. 3, 1808); they more resemble in size his figure of *A. hesperis*, given in the same work (Arg. t. 7); and I should have considered them that species but for the fact that he describes the under side of the

secondaries of the latter species as having all the spots buff, some of them occasionally sprinkled with a few scales of silver; in the three Moose specimens all the spots are of a brilliant silver. The insect much resembles *A. aglaia*, but, like *A. atlantis*, the ground colour of the under side of the secondaries is of a rich chocolate.

Grapta comma, Harris. — Very much resembles *G. c-album*, Linn.

Pieris protodice, Bois. — Like a faded specimen of *P. daphnice*, Linn.; but one specimen was taken.

Pamphila peckius, Kirby. — Evidently the American representative of *P. sylvanus*, Fab.; common.

Heteropterus mandan, Edw. — Much resembles *H. paniscus*, Fab.; common in 1883, but not observed before.

Nisoniades brizo, Bois. — Closely allied to *N. tages*, Linn.; three taken.

Two European species, but not of British genera, were taken, viz.:—

Eneis jutta, Hüb. — It would seem to be rare, as Mr. Haydon took but one.

One specimen of the widely distributed *Danais erippus*, Cram., was captured, and also one of *Limenitis archippus*, Cram., which so closely resembles the Danaine species, and departs in so remarkable a manner from the coloration of all other American and European species of *Limenitis*, that it is undoubtedly a case of mimicry; both sexes are alike in colour, and in this respect the mimetic resemblance differs from that between *Danais chrysippus*, Linn., and *Diadema misippus*, Linn., in which latter species the female alone mimics the Danaine form.

Four other species remain to be mentioned, which have more or less close allies on the European Continent, viz.:—

Maniola (Erebia) discoidalis, Kirby. — Staudinger places this species next to the European *M. disa* in his Catalogue, with the remark, "an spec. diversa"; the insect from Moose is entirely without ocelli in all the wings, either on the upper or under side.

Argynnis aphirape, Hüb., var. *tricularis*, Hüb. — Whether the American *A. tricularis* is distinct from *A. aphirape* must be left for future investigation; the specimens from Moose are larger than my Russian specimens of *A. aphirape*, var. *ossianus*, but I am

inclined to think them specifically identical; and that is the view held by Staudinger, but not by Edwards.

Three species of *Colias*, in addition to *C. erytheme*, var. *kewaydin*, Edw., mentioned in my last paper, were captured, viz.: *Colias edwardsii*, Behr., *C. occidentalis*, Scudder, and *C. pelidne*, Bois.; but whether the four species are distinct from each other and also from other European species I am not able to determine; one of the *Colias pelidne* was caught at Little Whale River, 450 miles north of Moose. The *Pyrameis cardui* from Moose has two of the black spots on the upper side of the secondaries with blue pupils, approaching in this respect the Australian variety *kershawii*, which has three of the spots so marked.

It will be gathered from these two communications that the butterflies of Hudson's Bay are essentially of European type, several species being quite identical, others geographical races only of European species, some few American types of European genera, and one species only, *Phyciodes tharos*, which belongs to a purely American genus. I am therefore disposed to agree with Staudinger that the Lepidoptera of Labrador and the territory adjacent should be included in the European fauna.

THE STORY OF *ÆCOPHORA WOODIELLA*.

BY JOSEPH SIDEBOTHAM, J.P., F.L.S., &c.*

THIS species occurs in the lists of British moths, but to most entomologists it is but a name, and very few have ever seen the insect itself, or know anything of its history. As I perhaps know more of it than anyone now living, it may be interesting to tell its story as far as I can.

This insect is figured in Curtis's 'British Entomology,' plate 304, and called *Woodiella*, and said to be "taken on Kersal Moor, Manchester, by Mr. R. Wood"; from this plate it has been copied with more or less success by Wood, Humphreys and Westwood, and Morris, but none of these authorities had seen a specimen.

When I first became a member of the Manchester Natural History Club—the old Banksian Society—in the year 1840,

* Read before Lancashire and Cheshire Entomological Society, January 28th, 1884.

L. H. Grindon, Edleston, Kenderdine, my cousin Ashworth, S. Carter, G. Crozier, and many others being present, one subject discussed was this *Æcophora woodiella*. It was captured in some numbers by Robert Cribb, who lived in Oldham Road, Manchester, who gave a specimen to R. Wood to send up to Curtis to get named; and as it was new to the entomologists in the district, he also gave a pair to Samuel Carter, and I think one to Geo. Crozier. I cannot trace this specimen. On Curtis naming the insect *Æcophora woodiella*, Cribb was so angry that it was named after Wood, and so indignant that Wood should have claimed the moth as his discovery, that he refused to part with another specimen to anyone. He had in a box fifty or sixty specimens, which he showed now and then to Carter and others, but nothing would induce him to part with them. The place where he said he took the insect was an old rotten tree—I think alder—growing not far from the path on the Manchester side of Kersal Moor; and as he took Crozier to the place to look for it before the unpleasantness arose, I believe this was quite true. Carter, Crozier, Ashworth, and I and others visited the place many times, but never saw a specimen, and I believe no other has been seen either there or anywhere else. Some said that it was a foreign species, and this aggravated Cribb the more, as he had no foreign insects; nor could anyone tell where the species could have come from, as it was unknown elsewhere. Whether it was that vexation and disappointment caused Cribb to become intemperate or not I cannot say, but he did become so, and gave up all his collecting.

Samuel Carter, who had always an eye to doing a little stroke of business, used to try and tempt Cribb, when not sober, to part with his box of *Æ. woodiella*, but without success; one day, however, he met him, and offered to give him ten shillings for the box. Cribb said, "Well, you shall have it, but it is in pawn for five shillings at a beerhouse in Oldham Road; if you will give me five shillings to get it out of pawn, I will fetch it, and you must give the other five shillings when you get it." To this Carter agreed; however, he did not see the box or his five shillings, and Cribb kept out of his way for weeks; one day, however, they met, and after angry words, Carter, who was most anxious to get the insects, said he would give him ten shillings for it, and pay the money he owed besides; so they went together to the beerhouse: when they saw the mistress of the house she said—"Oh! you

have come for your box of flies, have you? I stuck it in the fire, as you never came to pay your score as you promised."

So endeth *Æcophora woodiella*, except the specimen in Curtis's collection, which is, I believe, now in Australia, and the two specimens belonging to Carter. These were sold with his collection of British insects to the Manchester Museum of Natural History, and when we handed that institution over to Owen's College the collection and two *Æ. woodiella* went with it; and there the two specimens were, in capital preservation, the last time I saw them. The trustees lent me the specimens to exhibit at a meeting of the Manchester Field and Philosophical Society; and I took a photograph of them, and I also made very careful drawings of them. The copies of Curtis's, Wood's, Humphrey and Westwood's, and Morris's are all more or less unlike the original species. We may hope it will some day turn up again, and I have no doubt it will. *Lymexylon navale*, a conspicuous species of beetle, is recorded as having been once taken, in 1828, in Windsor Forest, and so none had any in their collections, except from the Continent; whilst all this time it had been existing in Durham Park, where my friend Mr. Chappell found it one summer evening a few years ago. Since then we have found out its habits and history, and it has been found in scores and seen in hundreds in its haunts in the park. So with *Æcophora woodiella*; I believe we only want to know its habits to find it again: and in these days of blue ribbon armies we may hope the specimens, when found, will meet with a better fate than being burned in the kitchen of a small public-house.

Bowdon, Cheshire, January 9, 1884.

THE GENUS *CERCYON*.

By REV. W. W. FOWLER, M.A., F.L.S.

THE species of this genus are usually very puzzling to beginners; this is by no means strange, if we remember that Stephens, in his 'Illustrations,' described no less than sixty species as British. These have since been reduced to seventeen, and one new one has been added; besides these, the closely allied genera *Megasternum* and *Cryptopleurum* must always be considered in any paper bearing on the Cercyons.

Whether we take their structure or their habits into consideration, the *Cercyonidæ* form the best connecting link between the *Hydrophilidæ* and the *Silphidæ*. In our catalogues and manuals they are usually placed immediately before the *Staphylinidæ*; it must however be admitted, at first sight, that there is a great break between *Cryptopleurum* and *Autalia*, and that the transition to *Leptinus* and the smaller *Silphidæ* is a much more natural one. This will become more evident if the anatomy of the groups is studied; in fact the *Cercyonidæ* might well be classed with the *Silphidæ*, but, on the other hand, their affinities to the *Hydrophilidæ* are so great that it seems hardly possible to remove them from that family. As regards habits they seem to belong to both groups; one or two species, like *C. aquaticus*, are almost, if not quite, entirely subaquatic; others, like *C. minutus* and *Megasternum*, prefer damp marshy places, but are also found in drier localities; the majority, however, are dung-feeders, and seem to rejoice in heat and sunshine, like the true *Necrophaga*.

The Cercyons are some of our great scavengers. In tropical countries they are very scarce, and in some regions seem to be unrepresented, their places being taken by the *Onthophagi* and *Scarabæi*. In summer they swarm all over our country; there is not a patch or heap of dung or decaying grass or rubbish that is not full of them. One or two species are found on the sea-shore, others are common in fungi; they may be taken by flinging refuse into water, when they rise to the surface, and they may be found by thousands in winter in flood rubbish. As a rule, however, only about one-half of the species will be found in the ordinary course of collecting; some of them are rare, and many are very hard to distinguish at first. It may therefore be of use to point out certain differences that may serve more easily to separate the species. The chief points to be noticed are size, and shape (whether round, oval, or pointed); striation (whether continued to apex of elytra or not); punctuation between interstices of elytra, and colour: the latter in some species is very constant, and a true mark; in others, as in *C. pygmæus*, by no means reliable: this probably led Stephens into error with regard to many of his species, which are only immature varieties of other forms.

In *Cercyon* proper the prosternum ends in one point behind, and the mesosternum is very narrow: in *Megasternum* and

Cryptopleurum the prosternum ends in two points behind, and the mesosternum is very broad. Of the latter two genera, *Megasternum* has the sides of the thorax not reflexed, and the anterior tibiæ strongly excised outside at the apex; while *Cryptopleurum* has the sides of the thorax reflexed, and the anterior tibiæ entire.

The several species, however, may be easily distinguished without having recourse to the under side, and it will perhaps be best to say a few words about each in turn, dividing the Cerceyons for this purpose into five groups.

The first group may be said to consist of *C. obsoletus*, *C. hæmorrhoidalis*, *C. hæmorrhous*, *C. aquaticus*, *C. flavipes*, and *C. lateralis*.

C. obsoletus, Gyll., is the largest species of the whole group, and may easily be distinguished by its size and nearly round form; in case, however, of any difficulty arising, it may be at once known by the fact that it has no impression at the base of the thorax: it is decidedly a rare species, and apparently prefers haystack refuse to dung. It has been found at Hanwell, Ealing, Notting Hill, Lee, Lerwick, and, I believe, near Burton-on-Trent.

C. hæmorrhoidalis, F.—The smaller size and more pointed elytra of this species distinguish it from *C. obsoletus*, which it much resembles in striation and punctuation; it possesses a strong depression at the base of the thorax. From *C. hæmorrhous* it may be separated by having the colour at the apex of the abdomen much less distinctly defined, and by the less strong punctuation of the interstices of the elytra. This is a common species. It is very abundant in hotbeds and dung.

C. hæmorrhous, Gyll., may be at once separated from the preceding by the small but distinct longitudinal impression at the base of the thorax above the middle of the scutellum, by its narrower shape, and by having the colour at the apex of the abdomen much more marked: its strong striation will also serve to distinguish it. Common in mud and by ditches.

C. aquaticus, Muls., may be at once separated from all other species by having not only the apex but also the margins of the elytra and thorax of a light red colour, the colour being most distinct and well defined, with no transitional space between the black and the red: it is a rare and local species, and appears to be entirely subaquatic. Dr. Power has taken it at Notting Hill and in Sheppy.

C. flavipes, F., may be separated by its black trophi (mouth parts), and also by having the apices of the elytra produced into a point; this is very evident if a carded specimen be held sideways against the light and examined with a lens. This distinction was pointed out to me by the late Mr. W. Garneys, of Repton. Very common.

C. lateralis, Marsh.—Very like the preceding at first sight, but the apices of the elytra are not produced. It is usually of a lighter colour, and the sides of the thorax are always broadly dull red. Some people, who have not seen a type of *C. aquaticus*, are apt to confuse it with that species, but the red margin in *C. aquaticus* is bright, narrow, and very clearly defined, while in *C. lateralis* it is broad and very obscure and merges into the dark colour of the disc of the thorax. Common.

The second group contains the two littoral species, *C. littoralis* and *C. depressus*, which may be separated from the rest of the genus by their flat, depressed, oblong shape; they vary in colour according to maturity.

C. littoralis, Gyll., is the larger of the two and has the striation of the elytra continued to the apex: it is very common on the coast, especially under decaying sea-weed.

C. depressus, Steph., is the smaller species, and has the striation obliterated at the apex. It occurs in many localities on the Devonshire coast, in the Isle of Wight, &c. It is not an uncommon species, and is found under the same conditions as the preceding.

The third group contains three very distinct and easily recognisable species, the colours being almost always constant in each: *C. unipunctatus*, *C. quisquilius*, and *C. melanocephalus*.

C. unipunctatus, L., is of a light yellow colour, and on each elytron is a distinct black semicircular spot, which join when the elytra are closed and present the appearance of one large spot; occasionally, but very seldom, the spots are nearly obsolete.

C. quisquilius, L., is about half the size of the preceding species, which it resembles in colour, except that the elytra are immaculate.

C. melanocephalus, L., is of a peculiarly bright reddish orange colour, with a well-marked dark triangle round the scutellum.

All these species are very common in hotbeds and dung.

The fourth group comprises the three smallest species of the family: *C. terminatus*, *C. pygmaeus* and *C. nigriceps*.

C. terminatus, Marsh., is considerably larger than *C. pygmæus*; it is a longer insect and less contracted behind. As a rule, it seems to have the apex, sides, and suture of the elytra of a light reddish colour, but is occasionally found quite black. The punctuation of the striæ of the elytra is much stronger than in *C. pygmæus*, and this, with the other points of difference mentioned, will serve to distinguish it. Dr. Power tells me that he has always taken *C. terminatus* flying (generally near a wood-stack), and that he cannot identify it from dung, in which *C. pygmæus* abounds. He has taken it at Merton, Notting Hill, Ealing, Cowley and Hampstead, and it has occurred in the Hastings district.

C. pygmæus, Ill., one of the commonest species, is very variable in colour; the distinctions above given will separate it from *C. terminatus*. Light specimens may be distinguished from *C. nigriceps* by invariably having a dark space round the scutellum, which is absent in the latter species. It is often almost entirely black.

C. nigriceps, Marsh., is at once distinguished by its light-coloured elytra and dark thorax; it looks very like a minute *C. quisquilius*, but is half the size of that insect, and much rounder, more convex, and less distinctly striated. It occurs in Surrey, Norfolk, and other localities.

The fifth group contains *C. minutus*, *C. lugubris*, *C. granarius* and *C. analis*.

At first sight these species very closely resemble each other; they are all more or less pointed species, and have the apex of the elytra of a more or less reddish colour. They are larger than the species of the preceding group, but smaller than any species of the other groups, except perhaps *C. quisquilius*.

C. minutus, F., is larger than either of the other three species; it is round and not much pointed behind, and is broad and very smooth. The interstices of the elytra are almost impunctate, and the striæ of the elytra are obsolete at the apex. This is one of our rarest species; it does not occur in dung, but in damp situations. Dr. Power has taken it at Notting Hill, but I know of no other locality.

C. lugubris, Payk., is distinguished from *C. minutus* by the fact that the striæ of the elytra are plainly continued to the apex, and from *C. analis*, which it very much resembles, by having the interstices of the elytra smooth (like *C. minutus*), whereas in

C. analis they are very closely and evidently punctured: this last is a very good and constant character. Common.

C. granarius, Er.—This species appears to be a great puzzle to collectors. It is a comparatively recent split from *C. lugubris*, from which it is said to differ in having the second joint of the maxillary palpi more dilated, and in the punctuation of the elytra. It is probably mixed with the former species in collections, and not rare. It is a question whether it is at most more than a variety of *C. lugubris*.

C. analis, Payk., is almost exactly like *C. lugubris* in general size and shape, but, as has already been pointed out, it may be at once distinguished by having the interstices of the elytra closely and distinctly punctured. It is very common.

Megasternum boletophagum, Marsh., which at first sight bears a strong superficial resemblance to the species of the last group of the Cercyons, may be told by its smooth elytra and oval shape; by its colour, which is reddish with no distinct patch of a lighter shade at the apex of the elytra; and also by having the sides of the elytra tucked in, as it were, so that the edge is not seen. It is very common in fungi, but may also be found on the edge of water and in damp places everywhere.

Cryptopleurum atomarium, F., is one of the most distinct species of the group. It is very broad and round, although the apices of the elytra are somewhat pointed, and may be at once told by its opaque, dull appearance, which is caused by its very strong striation, and by the deep punctuation of the whole of its upper surface. It is very abundant in dung and in all refuse.

I am much indebted to Dr. Power for many hints regarding the species, and also for localities. In future papers I hope to be able to give similar hints with regard to other of the more minute and obscure genera.

The School House, Lincoln, Jan., 17, 1884.

NOTES ON THE PAST SEASON IN COS. DERRY AND DONEGAL.

BY W. HOWARD CAMPBELL.

I CANNOT say, with most of your correspondents, that the past season has been a bad one as regards Macro-lepidoptera. Although many common species were much scarcer than usual,

and several did not appear at all, yet the results of our entomological work have, in spite of unfavourable weather, been encouraging. As notes from the North-west of Ireland have not before appeared I shall give a list of the best of our captures during the season.

As we were unable to begin collecting before May, I can say nothing as to the early species. In May we devoted most of our attention to larvæ, and succeeded in taking the following species :—

| | |
|--------------------------------|----------------------------|
| <i>Bombyx callunæ</i> | <i>Triphæna fimbria</i> |
| <i>Odonestis potatoria</i> | <i>T. janthina</i> |
| <i>Crocallis elinguaris</i> | <i>Xanthia silago</i> |
| <i>Oporabia dilutata</i> | <i>X. cerago</i> |
| <i>Eupithecia rectangulata</i> | <i>Plusia pulchrina</i> |
| <i>Melanippe montanata</i> | <i>P. iota</i> |
| <i>Cidaria testata</i> | <i>P. chrysis</i> |
| <i>Agrotis agathina</i> | <i>P. interrogationis.</i> |

In the same month we took in the perfect state :—

| | |
|------------------------------|-----------------------------|
| <i>Satyrus megæra</i> | <i>Anticlea badiata</i> |
| <i>Notodonta dromedarius</i> | <i>Cidaria russata</i> |
| <i>Odontopera bidentata</i> | <i>Tæniocampa rubricosa</i> |
| <i>Eupithecia castigata</i> | <i>Hadena thalassina</i> |
| <i>Ypsipetes impluviata</i> | <i>Anarta myrtilli.</i> |

In June we took larvæ of—

| | |
|-----------------------------|-------------------------------|
| <i>Eriogaster lanestris</i> | <i>Oporabia filigrammaria</i> |
| <i>Chelonia plantaginis</i> | <i>Cidaria populata</i> |
| <i>Saturnia carpini</i> | <i>Chesias spartiata</i> |
| <i>Notodonta ziczac</i> | <i>Dianthœcia conspersa</i> |
| <i>Himera pennaria</i> | <i>D. capsophila</i> |
| <i>Nyssia zonaria</i> | <i>Plusia festuæ.</i> |
| <i>Larentia cæsiata</i> | |

Imagines of—

| | |
|------------------------------|---------------------------------|
| <i>Satyrus ægeria</i> | <i>Thera variata</i> |
| <i>Hepialus velleda</i> | <i>Melanippe galiata</i> |
| <i>Chelonia plantaginis</i> | <i>M. ocellata</i> |
| <i>Arctia fuliginosa</i> | <i>Eubolia palumbaria</i> |
| <i>Platypteryx lacertula</i> | <i>Thyatira batis</i> |
| <i>Iodis lactearia</i> | <i>Acronycta rumicis</i> |
| <i>Scodiona belgaria</i> | <i>Apamea basilinea</i> |
| <i>Lomaspilis marginata</i> | <i>A. gemina</i> |
| <i>Emmelesia albulata</i> | <i>Miana fasciuncula</i> |
| <i>Larentia pectinitaria</i> | <i>Agrotis porphyrea</i> |
| <i>Eupithecia satyrata</i> | <i>Hadena adusta</i> |
| <i>E. vulgata</i> | <i>Cucullia umbratica</i> |
| <i>E. minutata</i> | <i>Plusia pulchrina</i> |
| <i>E. pumilata</i> | <i>Nyssia zonaria</i> (our most |

important capture). My brothers, in company with our friend

Mr. J. N. Milne, took a number of larvæ of this species on sand-hills on the Antrim coast. That a species so local in England—a species the females of which are apterous—should be found in such a locality is certainly a most interesting fact. We have since succeeded in forcing two or three of the pupæ, and have thus made sure of the identity of the species; and there is no appreciable difference between the specimens we have bred and the ordinary English types.

In July, in addition to species already mentioned, we took larvæ of—

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|----------------------|-------------------------|
| Demas coryli | Cymatophora flavicornis |
| Amphydasis betularia | Celæna haworthii |
| Eupithecia venosata | Hydrœcia nictitans |
| Cidaria miata | Anarta myrtilli. |
| Dicranura vinula | |

Imagines of—

| | |
|------------------------|---------------------|
| Satyrus semele | Cidaria prunata |
| Argynnis aglaia | C. populata |
| Nudaria mundana | C. testata |
| Ellopiæ fasciaria | C. comitata |
| Cleora lichenaria | Eubolia mensuraria |
| Venusia cambricaria | Anaitis plagiata |
| Acidalia scutulata | Thyatira derasa |
| A. inornata | Miana arcuosa |
| Emmelesia alchemillata | Abrostola triplasia |
| Eupithecia centaureata | Plusia chrysitis |
| Melanthia albicillata | P. festuæ. |
| Coremia minutata | |

Noctuæ were to be found in great abundance during this month at the flowers of various grasses. Sugar was tried on several occasions, but without success.

In August we took larvæ of *Macroglossa stellatarum*, *Smerinthus populi*, *Dicranura furcula*, *Notodonta camelina*, and *Hadena pisi*. Imagines of—

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|----------------------|-------------------------|
| Crocallis elinguaris | Agrotis tritici |
| Selenia illunaria | A. aquilina |
| Melanthia rubiginata | A. obeliscæ |
| Leucania littoralis | A. vallisera |
| Hydrœcia micacea | A. præcox |
| Charæas graminis | A. cursoria |
| Apamea fibrosa | Noctua glareosa |
| Celæna haworthii | N. umbrosa |
| Miana literosa | Polia chi |
| Caradrina alsines | Amphipyra tragopogonis. |

All the Noctuæ above mentioned, *P. chi* and *C. haworthii* excepted, and a number of other species, were taken at ragwort. There is no other plant nearly so attractive as ragwort in this locality. We have, during the last few years, taken at least sixty species at its flowers.

Many of the August insects continued to be taken in September. In addition we took larvæ of—

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|------------------------------|---------------------------|
| <i>Orgyia antiqua</i> | <i>Notodonta dictæa</i> |
| <i>Bombyx rubi</i> | <i>N. dictæoides</i> |
| <i>Platypteryx lacertula</i> | <i>Agrotis porphyrea.</i> |

Imagines of *Orgyia antiqua*, *Agrotis agathina*, and *Xanthia ferruginea*.

During October and November, owing to the inclemency of the weather, we did very little entomological work; ivy was a complete failure.

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|------------------------|------------------------------|
| <i>Cidaria miata</i> | <i>Orthosia macilenta</i> |
| <i>Agrotis suffusa</i> | <i>O. lota</i> |
| <i>A. saucia</i> | <i>Anchocelis pistacina,</i> |

usually pretty common, did not put in an appearance; only a few

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|-------------------------------|--------------------------|
| <i>Cerastis vaccinii</i> | <i>Calocampa vetusta</i> |
| <i>Scopelosoma satellitia</i> | <i>C. exoleta</i> |

were seen. A few larvæ of *Acronycta psi*, and some pupæ of *Notodonta dromedarius*, *N. ziczac*, and *Amphydasis betularia* were our only other captures during these months.

Ballynagard House, Londonderry, Jan. 2, 1884.

DESCRIPTION OF A *PIERIS* NEW TO SCIENCE— *PIERIS SPILLERI*, Muhl.

BY A. J. SPILLER.

Male.—Expanse of wing 1" 8"; apex of anterior wings produced; posterior wings rounded. Upper side: All the wings bright canary-yellow, perfectly spotless, with the exceptions that the apex and a small portion of the costal and inner margin are dusted with black. Under side: Canary-yellow, unspotted.

Female.—Expanse of wing 1" 7"; apex of anterior wings not so pointed as in the male; posterior wings rounded; colour and markings similar to male. Under side: Anterior wings canary-yellow; costal and hind margins orange-yellow; posterior

wings dull orange-yellow, with row of four indistinct gray spots parallel to rounded hind margin.

Described from twelve specimens taken in Natal, six of which are in my own collection, and the remainder in the possession of Dr. Staudinger.

This species was captured by me in 1881, and would have been described prior to this had I not deferred in order to be certain that it had not previously been described. As the insect is not in the Cape or British Museum Collections, and is unknown to collectors of exotic insects who have examined it, and as Dr. Staudinger has pronounced it to be a new and interesting species, I beg therefore to name it after myself.

This species is evidently very rare in Natal; its flight is rapid and cannot be confounded with the similarly-coloured species of the genus *Terias*, these latter insects being feeble flyers.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLLECTING DURING 1883 SOUTH OF LONDON.—Most Macro-Lepidoptera have been decidedly scarce during the past season in and around this locality, many species appearing on the wing much behind their usual time. The following are some of the captures and notes made by me during the season:—*Brephos parthenias* was not fully out till April, and then much less numerous than usual. On June 30th I took a very fresh female *Anthocharis cardamines*, from its condition apparently only just emerged (the earliest I have taken this species is April 25th,—1880, a male). A female *Satyrus tithonus*, but worn, on September 14th. Other insects which put in a late appearance were *Metrocampa margaritaria*, in perfect condition, August 13th; *Ennomos tiliaria*, perfect, October 7th; and *Catocala nupta*, just out, September 28th. *Argynnis euphrosyne* I did not notice out until May 23rd, when they appeared somewhat abundantly. *Acidalia aversata* and *A. remutata* were unusually abundant during June, July, and August; some I took were of quite a tawny hue. June 30th, I obtained by beating yew trees several *Larentia pectinataria* and *Melanippe procellata*; also *M. unangulata* and *Phibalapteryx tersata*. I also took *Dianthæcia conspersa*, *Cucullia umbratica*, *Miana fasciuncula* at rest, and *Asthena*

luteata, on the same day. *Phorodesma bajularia* were flying very abundantly between seven and eight o'clock p.m., July 5th, when I succeeded in netting six fine specimens, but most of them were flying out of reach; I never before saw them so numerous at one time: this was at West Wickham. I also caught during the same month *Ellopiia fasciaria*, *Macaria liturata*, *Fidonia piniaria*; for the latter, Newman gives April and May as time of appearance, but I have generally found it most abundant about the third week in June. Also, during July, *Acidalia emarginata* and one female *Apatura iris*, taken on the wing, near Chatham; and *Pachynymia hippocastanaria* on August 13th. *Vanessa atalanta* was very plentiful during September and October. *V. cardui* was fairly common, and I took five in perfect condition on September 23rd, and noticed a great number of hybernated specimens during May and June. I did not try "sugaring" until the second week in October, when I then took on one evening *Amphipyra pyramidea*, *Scopelosoma satellitia*, *Miselia oxyacanthæ*, *Cerastis vaccinii*, *Anchocelis pistacina*, and *Xanthia ferruginea*; *Orthosia lota* on the 9th and 13th. *C. vaccinii* and *A. pistacina* were very abundant on most evenings at "sugar," and also at ivy bloom. During the same month, at gas-lamps, I took *Cidaria miata*, *Eubolia cervinaria*, and *E. tiliaria*, on the same evening; and a good series of *Hybernia defoliaria* on the 30th and 31st, including a very dark variety. I did not see one *V. io* during the whole season. The long row of palings surrounding part of Addington Park, on the West Wickham side, usually so productive of various moths, was quite a failure all through the season, as I searched them many times without any good result. On four occasions I searched them at seven o'clock a.m., in August and September, and not a lepidopterous insect was to be found.—FRED. W. FROHAWK; Upper Norwood, S.E., December 15, 1883.

HUNTINGDONSHIRE DIURNI. — The list of Huntingdonshire butterflies in the 'Entomologists' Monthly Magazine,' contained the names only of those species caught by myself within 1882-3, numbering forty-two. Mr. J. Jenner Weir having referred to the list, and given such an excellent one from Sussex, I should like to add those species which were omitted, but yet are authentic captures:—43 *Papilio machaon*, 44 *Argynnis lathonia*, 45 *Polyommatus hippothoe*, 46 *Melitæa artemis*, 47 *Vanessa c-album*, 48 *Satyrus semele*, 49 *Vanessa antiopa*?, 50 *Aporia crataegi*, 51

Lycæna agestis, 52 *L. alsus*, 53 *L. argiolus*, 54 *L. arion* (Newman's 'Butterflies,' p. 140.) This brings the total to fifty-two, or ten more, excluding *Hippothœ* and *Antiopa*. The reason I asked entomologists for their county lists was to compare numbers and kinds as to local distribution. The use is evident. Will those friends who intend to forward lists kindly do so as quickly as possible?—HERBERT E. NORRIS; St. Ives, Hunts, Feb. 7, 1884.

ABNORMAL EMERGENCE OF *CHELONIA CAJA*.—It may be interesting to the readers of the 'Entomologist' to know that I have just had three *Chelonia caja* emerge from the pupæ, one male and two females. They pupated in October, and are fine specimens. I have not in any way forced them; and the females have already laid about seventy eggs. I have also had *Attacus luna* emerge this month.—J. M. CLISSOLD; 23, Victoria Square, Clifton, December 15, 1883.

ABNORMAL EMERGENCE OF *NOCTUA AUGUR*.—On November 26th I was much astonished at the appearance of a moth in one of my breeding-cages; as I had not been breeding any insects which should emerge in the autumn, I had no reason to expect any apparition. It proved to be a small specimen of the above-named moth; and in the same box I also discovered a good many pupæ of the same species. The larvæ were bred from eggs in June; and having been kept out of doors I expected that they would hibernate in the usual way. I should be glad to know if such a thing occurs commonly.—C. S. BOUTTELL; 3, Chestnut Villas, Forest Gate, Essex, December 4, 1883.

REARING LARVÆ OF *TÆNIOCAMPA OPIMA*.—The great difficulty experienced in rearing this species from the ova by Mr. Walpole (Entom. xvii. p. 43), leads me to believe that a description of the method by which I have successfully reared *T. opima* to the pupal state may be interesting to some of the readers of the 'Entomologist.' On May 8th, 1883, I received a batch of eggs from New Brighton, Cheshire. I at once put them in a glass-top box, which I placed on my table to be examined every morning. On May 10th three or four larvæ hatched, which were semi-transparent and greyish, with the head and anterior segments darker. On May 11th all the eggs, between two and three hundred in number, hatched. I then procured a wide-mouthed, white-glass bottle, in which I placed some young shoots of willow

and swallow. I then removed the lid of the glass-top box, and turned box, lid, and newly-hatched larvæ into the glass bottle, and closed the mouth with a cork. In removing the lid a few larvæ may be crushed, but this is unavoidable. On May 19th I changed the bottle for a larger one, but still on the air-tight principle. In removing the larvæ I do not touch them, but introducing a sprig of fresh food they gradually crawl on to the new leaves, and I remove the leaves and larvæ to bottle No. 2.; this has to be repeated till all the larvæ are removed. Great care must be taken not to place the food in when *damp*; the leaves should be gathered, if possible, in the sun, and if compelled to gather them in the damp they should be dried with a cloth before admitting them into the cage. On May 24th I replenished their food; their size was rapidly increasing, and they had twice moulted, and spun the leaves together after the manner of a *Tortrix*. When I found they had attained too large a size to be fed by the air-tight process, I procured a number of jam-pots, and placed about a dozen larvæ in each, with some sandy earth at the bottom for them to burrow in. I then placed in the food-plant and covered the pot with a piece of glass. When they became full-fed I either limited the number of larvæ or procured larger pots—always increasing the depth of earth for their pupation. Nearly all my larvæ grew to perfection, showing many beautiful varieties. I do not think I lost more than two or three dozen, which were killed by accident when changing their food. I have now a dozen jam-pots containing numerous pupæ. So far I have been successful. The number of imagines that will emerge is of course a matter of great uncertainty. The great advantage of this method is, firstly, the food-plant keeps fresh for some days, preventing the continual disturbance to young larvæ caused by frequently introducing fresh food; secondly, they are warmer and free from draught and sudden change of temperature. One thing is always to be remembered, *never* place them in the sun, or in a very hot place, as the moisture which would collect in the bottle would drown small larvæ. I am afraid many will think these notes superfluous, as this method is not original, but has been mentioned in 'Knagg's Guide'; and Mr. Stainton recommended, in the pages of the 'Entomologists' Companion,' glass cylinders and jam-pots, as many years ago as 1852. While writing this, a fine *Tæniocampa*

opima has emerged from one of the chrysalids.—C. G. HALL; 3, Granville Road, Deal, February 10, 1884.

EARLY SPRING LEPIDOPTERA.—I have already on my setting-boards a long series of varieties of *Hybernia leueophearia* and several *Nyssia hispidaria* taken in Richmond Park, Surrey. The former were taken in January, and the latter in the second week in February.—JOHN T. CARRINGTON.

LAPHYGMA EXIGUA.—On the 28th of last September I took a specimen of this little Noctua at light, at Romsey, Hants.—EDWARD BUCKELL; 32, Gibson Square, N., February, 1884.

HYMENOPTEROUS PARASITES OF LEPIDOPTERA.—The following list is uniform with those previously published. The names printed in small capitals refer to species which are not included in Marshall's Ent. Soc. Catalogue (1872). There are some specimens, which require further examination, that correspondents will not find mentioned in this list, but they are not forgotten; and I take this opportunity of thanking all who have kindly saved for me any of the parasites they have bred. These have been found useful to fellow-workers and to myself, and will materially help to extend the knowledge of our Ichneumon fauna.

Trogus lutorius, F., from *Sphinx ligustri* (G. T. Baker).

[ANISOBAS CEPHALOTES, Kriechb., from *Lycæna iolas* (Baker); pupa from Hungary.]

Eurylabus tristis, Wesm., from *Dianthæcia capsicola* (G. H. Raynor).

Platylabus rufus, Wesm., from *Ypsipetes impluviata* (Raynor).

Phæogenes melanogonus, Gmel., from *Endopisa leplastriana* (G. Elisha).

Cryptus obscurus, Gr., from *Euchelia jacobæ* (Raynor).

Agrypon flaveolatum, Gr., from *Eupithecia pumilata*, *Ypsipetes impluviata* (Raynor).

PANISCUS FUSCICORNIS, Holmgr.?, piercing larva of *Lithostege nivearia* (Raynor).

Campoplex mixtus, Gr., from *Notodonta camelina* (J. A. Osborne).

Casinaria vidua, Gr., from *Abraxas grossulariata* (Raynor).

Limneria chrysosticta, Gr., from *Yponomeuta padella* (Raynor).

• L. ELISHÆ, Bridgm., n. s., from *Ornix scoticella* or *Nepticula aucuparia* (Elisha).

L. exareolata, Ratz., from *Lithocolletis ulmifoliella* (Elisha).

L. geniculata, Gr., from *Depressaria heracliana* (Elisha).

L. INTERRUPTA, Holmgr., from *Phtheochroa rugosana* (Elisha).

L. mutabilis, Holmgr., from *Ephippiphora scutulana* or *E. pflugiana* (Elisha).

- L. VIRGINALIS*, Gr., from *Endopisa leplastriana*, *Gracilaria stigmatella* (Elisha).
Exetastes nigripes, Gr., from *Hadena oleracea* (Osborne).
E. n. ? s., from *Hadena pisi* or *Acronycta psi* (Baker).
Exochus mansuetor, Gr., from *Tortrix* on willow (E. A. F.).
Pimpla instigator, F., from *Triphæna fimbria* (Elisha).
P. scanica, Vill., from *Eurymene dolobraria*, *Endopisa leplastriana*, *Lithocolletis cavella* (Elisha).
P. graminellæ, Schr., from *Ephippiphora scutulana* or *E. pflugiana* (Elisha).
Glypta vulnerator, Gr. ?, from *Semasia rufillana* (Elisha).
Bracon minutator, F., from *Argyrolepis zephyrana* (Elisha).
Colastes braconius, Hal., from *Lithocolletis quercifoliella*, *L. lantanella* (Elisha).
ASCOGASTER RUFIDENS, Wesm., from *Hybernia defoliaria*, *Tortrix* (C. G. Bignell).
Acalius germanus, Hal., from *Ornix scoticella* or *Nepticula aucuparia*, *Lithocolletis schreberella* (Elisha).
APANTELES TETRICUS, Rhd., from *Satyrus janira* (Bignell).
A. ruficrus, Hal., from *Agrotis præcox* ? (G. T. Porritt).
A. PERSPICUUS, Nees, from *Leucania litoralis* (Bignell); *L. pallens* (Raynor).
A. glomeratus, L., from *Phigalia pilosaria* (Bignell).
A. brevicornis, Wesm. (= *placidus*, Hal.), from *Tæniocampa miniosa* (Bignell).
A. SPURIUS, Wesm., from *Vanessa urticæ*, *Arctia caja*, *Leucania litoralis* (Bignell).
A. juniperatæ, Bouché, from *Hybernia progemmaria*, *Cheimatobia brumata*, *Dianthæcia cucubali* (Bignell).
A. LONGICAUDA, Wesm., from *Solenobia inconspicuellæ* (C. J. Boden).
A. FRATERNUS, Rhd., from *Aspilates citraria* (Bignell).
A. bicolor, Ns., from *Lithocolletis lantanella*, *L. lantella* (Elisha).
A. vitripennis, Curt., from *Diloba cæruleocephala*, *Miselia oxyacanthæ*, *Amphipyra pyramidea* (Bignell).
A. fulvipes, Hal., from *Xylina rhizolitha*, *Catocala nupta* (Bignell).
A. NOTHUS, Rhd., n. s., from *Arctia menthastri*, *Anticlea badiata*, *Tethea retusa*, ? *Satyrus janira* (Bignell).
MICROPLITIS FUMIPENNIS, Ratz., from *Tæniocampa miniosa* (Bignell).
M. MEDIANUS, Rthe., from *Cerastis spadicea* (Bignell).
Microgaster flavipes, Hal., from *Boarmia repandata* (J. A. Cooper).
THEROPHILUS NUGAX, Rhd., from *Eupæcilia roseana* (Elisha).
T. tumidulus, Ns., from *Semasia rufillana*, *Depressaria atomella* (Elisha).

Perilitus scutellator, Ns. from *Scopelosoma satellitia* (Hellins, Bignell).

P.ceptor, Wesm., from *Crocallis elinguaris* (Bignell).

P. PULCHRICORNIS, Wesm., from *Hybernica leucophearica*, *Anisopteryx æscularia*, *Cheimatobia brumata*, *Oporabia dilutata*, *Harpella geoffrella* (Bignell).

Macrocentrus linearis, Nees (var. *pallipes*), from *Depressaria alstræmeriella* (Elisha).

Monodontomerus æreus, Wlk., from *Homæosoma* sp. (Porritt).

Eulophus ramicornis, Geof., from *Cosmia trapezina* (R. M. Sotheby).

—EDWARD A. FITCH; Maldon, Essex.

ICHNEUMONS AND THEIR HOSTS.—The following list of Ichneumons, bred this year by one entomologist, plainly shows how much very valuable material is annually lost in this country where so many Lepidoptera are bred. The insects were bred by Mr. W. H. B. Fletcher, of Worthing, who not only saved them, but also very kindly has given me all the specimens, and for which I am deeply indebted to him. Amongst them are several which appear undescribed, whilst others are new to Britain; from *D. heracliana* was bred *Pimpla spuria*, Gr., noticed a short time ago in this Journal (Entom. xvi. 251). Since that notice appeared I have received two more males; these also have black coxæ. This insect might easily have the sexes separated, and most probably has in some collections, the male being mixed up with *P. examiner* and the female with *P. turionellæ*.* From the same host was bred an Ichneumon which comes very near *I. gasterator*, Steph.; but Mr. Fitch has compared it with the two specimens in the British Museum, and says it is not that species. If that is the case, then I believe it is a new one. Two of the *Hemiteles* I recently described have also been bred: *H. incisus*, of which both sexes were bred, the male only is described; and *H. marginatus*, from *Chrysocorys festaliella*. A new species of *Anomalon* was bred, it is not more than half the size of anything yet described; and also a little *Tryphon*, of about 3 mm. in length, which, I believe, is also new: I am at a loss to know into what genus to put it. A *Limneria*, which I believe to be *L. cylindrica*, Brischke, is new to Britain; and both sexes of *L. dispar*, Gr.?, the female of which is undescribed. From *Gelechia notatella* was bred a small *Exochus*, which certainly is

* Since the above was in print Professor C. G. Thomson, to whom I sent the insect, has written me that it is certainly his *P. strigileuris*.

not described by Holmgren or Gravenhorst, and which I believe to be a new species. From *Eupæcilia udana*, taken at Wicken Fen, *Glypta pedata*, one of Desvignes' species, was bred. I am indebted to my friend Mr. E. A. Fitch for the names and following notes on the *Braconidæ*, for although I collect all I meet with I have not yet had time to study that group. *Rhogas irregularis*, Wesm., is not included in Marshall's catalogue, but is not by any means rare in Britain; two specimens bred from *A. unanims*. The green cocoons of *Microplitis spectabilis* ex *Luperina cespitis* are very distinct. *Therophilus clausethalianus*, Ratz., is larger than *T. tumidulus*, and doubtless a good species; it was named after *Penthina hercyniana* (*clausethaliana*, Ratz.) from which it was bred by Herr Saxesen. There are one or two *Microgasterids* still to determine. Altogether this collection of *Ichneumon*s contains more novelties than any similar quantity I have ever received.

Ichneumon n. ? s., from *Depressaria heracliana*.

I. lepidus, Gr., from *Depressaria heracliana*.

Hypomecus albitarsis, Wesm., from *Ephyra punctaria*.

PHŒOGENES CICUTELLA, Sieb., from *Orthotelia sparganella*.

Mesostenus obnoxius, Gr., from *Zygæna filipendulæ*.

Hemiteles areator, Pz., from *Coleophora fuscadinella*.

H. marginatus, Bridgm., from *Ephyra orbicularia*.

H. incisus, Bridgm., male and female, from *Laverna epilobiella*.

Hemimachus instabilis, Foerst., from *Laverna epilobiella*.

Anomalon n. ? s., from *Chrysocorys festaliella*.

Paniscus testaceus, Gr., from *Nonagria geminipuncta*; *Dicranura vinula*.

P. tarsatus, Brischke, from *Eupithecia vulgata*.

Linneria dispar, Gr., male and female?, from *Coleophora genistæcolella*; *C. albitarsella*.

L. tibialis, Gr., from *Coleophora gryphipennella*.

L. cylindrica, Brischke, from *Gelechia inopella*.

L. sp.?, from *Depressaria chærophylly*.

L. rufipes, Gr., from *Laverna epilobiella*.

L. sp.?, from *Gonepteryx rhamni*.

L. molesta, Gr.?, from *Ephippiphora scutulana*.

L. uncinata, Gr., from *Acronycta alni*.

L. sordida, Gr., from *Lycæna alsus*.

L. virginialis, Gr., from *Gracilaria stigmatella*.

L. concinna, Holmgr., from *Gelechia notatella*.

L. transfuga, Gr., ? var., scape black beneath, from *Tischeria emyella*.

L. interrupta, Holmgr., from *Eupæcilia udana*.

Mesochorus vitticollis, Holmgr., *Chrysocorys festaliella*.

M. confusus, Holmgr., from *Lycæna alsus*.

Tryphonid gen.?, from *Chrysocorys festaliella*.

Exochus flavomarginatus, Holmgr., from *Eudorea truncicolella*.

E. n. ? s., from *Gelechia notatella*.

PIMPLA STRIGIPLEURIS, Thoms., from *Depressaria heracliana*.

P. graminellæ, Schr., from *Clostera reclusa*.

P. sp.?, from *Ephippiphora scutulana*.

P. nucum, Ratz., from *Gelechia anthyllidella*; *G. inopella*; *Laverna epilobiella*.

Glypta consimilis, Holmgr., from *Ephippiphora scutulana*.

G. pedata, Desv., from *Eupæcilia udana*.

Lissonota impressor, Gr., from *Luperina testacea*.

RHOAS IRREGULARIS, Wesm., from *Apamea unanims*.

Chelonus sulcatus, Jur., from *Eudorea truncicolella*.

APANTELES TENEBROSUS, Wesm., from *Gelechia* on *Atriplex*.

A. viminetorum, Wesm., from *Gelechia instabilella*.

A. lacteus, Nees, from *Gelechia inopella*; *Swammerdamia pyrella*?

A. SPURIUS, Wesm., from *Ephyra orbicularia*.

A. NIGRIVENTRIS, Nees?, from *Notodonta dromedarius*.

A. bicolor, Nees, from *Lithocolletis spinicolella*.

A. FULIGINOSUS, Wesm., from *Gelechia instabilella*.

A. lateralis, Hal.?, from *Simæthis fabriciana*.

A. PALLIPES, Rhd., from *Plusia gamma*.

Microplitis spectabilis, Hul., from *Luperina cespitis*.

Orgilus obscurator, Nees, from *Coleophora niveicostella*.

Therophilus cingulipes, Nees, from *Cochylis francillana*; *Chauliodus daucellus*; *Gelechia anthyllidella*.

T. tumidulus, Nees, from *Gelechia inopella*.

T. CLAUSTHALIANUS, Ratz., from *Ephippiphora scutulana*.

PERILITUS PULCHRICORNIS, Wesm., from *Eudorea truncicolella*.

P. ictericus, Nees, from *Gelechia costella*?

—JOHN B. BRIDGMAN; 69, St. Giles Street, Norwich.

PHYSIANTHUS ALBENS, AN INSECTIVOROUS PLANT.—There is a beautiful house, just under Table Mountain, with a fine garden, and at the entrance is an old stone wall covered with a singular creeper,—*Physianthus albens*. It was in blossom with highly-scented white flowers, but there is something most singular about it; the flowers are from an inch to an inch and a half long, and at the inside base the corolla is inflated and glutinous. Butterflies and moths are attracted, but no sooner do they insert the proboscis than they are caught, and cannot withdraw

it. All the small butterflies are soon closed over by the petals, which form their shroud. What astonished me most was to see moths two inches long fixed fluttering for hours quite unable to withdraw the proboscis. I extract the above remarks from a letter received from my uncle,—a fine old sportsman and naturalist, who resides in South Africa,—thinking they may interest your readers.—CLARENCE E. FRY; Watford, Feb., 1884.

REVIEW.

Butterflies of Europe. By H. C. LANG, M.D., F.L.S. Part XVII.
London: Lovell Reeve & Co., Covent Garden.

THIS, the last part issued of Dr. Lang's very valuable work, is quite up to the standard of the best parts already published. It contains the continuation of the Satyridæ, and includes the genera *Erebia*, *Eneis*, and *Satyrus*. The coloured plates illustrating these confusing genera will be found most useful, on account of their accuracy. We understand that three or four more parts will complete the work, which will have the honour of being the first ever written to give collected figures arranged seriatim of all European butterflies; and will be undoubtedly the best book on the subject that has appeared since Herrich-Schäffer's 'Schmetterlinge von Europa.' In the latter work the plates are hand-coloured in the finest manner, which made the cost of its purchase beyond the means of most persons who take an interest in this subject; but in the case of Dr. Lang's work, chromo-lithography has furnished a sufficiently good text-book for all ordinary purposes.

Besides providing figures and descriptions of every strictly European species, the author has briefly described the remaining palæarctic species known up to the present date. Added, are short notices at the end of each family of such North-American forms as are most nearly allied to those of the palæarctic region, thus rendering the book very complete.

Before closing this notice, mention should be made of the excellently careful work of Mr. Horace Knight, for the firm of West, Newman & Co., who has drawn from nature all the figures of the species represented.—J. T. C.

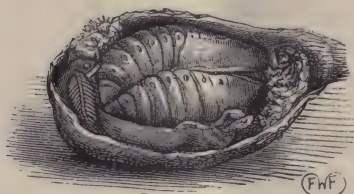
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SATURNIA CARPINI.



SATURNIA CARPINI.

IN the beginning of the year 1882 I received a few cocoons of *Saturnia carpini*, which all produced imagines in due course, excepting one, which I opened some time after to ascertain the cause, and was somewhat surprised by finding two male pupæ enclosed in it, lying side by side. From one the moth had emerged, but instead of making its exit through the usual aperture in the cocoon, it had somehow managed to turn round and make its way to the opposite end, where it was fixed and dead; its wings, however, were somewhat developed. Upon referring to the above woodcut the details of this unusual incident may be more clearly understood: at the two ends may be seen the skins of the respective larvæ, which is the more remarkable as both pupæ have their heads in one direction. Probably the skin at the aperture was the cause of the moth being unable to escape. It would have been interesting had the way in which the larvæ spun up been noted.

FRED. W. FROHAWK.

Upper Norwood, S.E., March 24, 1884.

ENTOM.—APRIL, 1884.

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RHOPALOCERA OF CARLSBAD.

BY THE REV. WILLIAM BECHER.

In the year 1883 my brother Captain Becher and myself spent three weeks at Carlsbad, from June 24th to July 12th. During this period we worked hard collecting the Rhopalocera of the neighbourhood.

The weather, with one or two exceptions, was all that could be desired, warm nights and hot sunny days prevailing; indeed an occasional rainy day enabled us to thoroughly overhaul our captures, and arrange them ready for our return to England.

The town of Carlsbad is very picturesquely situated in the valley of the Pepel, on either side of that river, close to its junction with the Eger. We found comfortable quarters at the "Duke of Edinburgh," in the Schloss-platz. Nearly opposite our lodgings are some of the springs for which the town of Carlsbad is so celebrated; indeed its prosperity is owing to the medicinal virtues of the waters, which in many places are hot. With these, however, we have nothing to do; rather let us turn to the peculiarities of the town from an entomologist's point of view.

The valley, roughly speaking, runs east and west, with high hills abruptly sloping down to the river. Here and there some hollow or projecting spurs lend variety to the landscape, and give promise of fruitful hunting-grounds; a promise very often unfulfilled, as every entomologist knows who has ever explored fresh districts.

The all-important question of the flora of Carlsbad is a very difficult one to answer. I should say there is a considerable variety, including many well-known friends; but when one comes to enumerate the trees the task is less formidable. Pine is the most common tree, forming woods of great extent, and furnishing the inhabitants with the greater part of their fuel for the winter. Here and there the sombre foliage is relieved by a silver birch, or an occasional row of acacia gives variety to the scene. Down by the river bank the alder is abundant, while the moisture-loving willow is far from uncommon. The oak does not appear to be much cultivated, and, except in the gardens or in the neighbourhood of the town, can seldom be dignified with any

other name than brushwood. The lime tree is common in the streets; while two species of poplar, horse-chestnut, ash, and beech may be occasionally met with. In addition to this the cultivation of rose trees, for the sale of the flowers, is an important item in the trade of Carlsbad.

Our total number of species captured was fifty-five; but I think if we had been able to converse fluently with the peasants we should most probably have added to our list. Even boys, who in England are such a nuisance, at Carlsbad are willing, as the following incident shows, to help, and do not expect reward. One day my brother found himself followed by a troop of children, who annoyed him by the persistence with which they watched him. He refrained, however, from telling them in forcible German to betake themselves elsewhere, and patiently endured their company. After a while one of them went away, and returned with a fine female specimen of *Limenitis populi*. How on earth the lad managed it I do not know, as we always found this a most difficult species to capture.

Perhaps before I give further particulars in my notes it would be as well to explain where some of the localities I refer to are situated, but it ought to be borne in mind that replanting and felling may completely alter the character of some of the localities referred to.

We found the neighbourhood of the cemetery very good ground, especially on the road which runs between the tall timber on the one hand and the younger trees on the other. I should think the distance from our lodging would be about two or three miles, but, owing to the precipitous nature of the sides of the valley, we had to go some way round. The cemetery is on the north side of the valley, quite out of sight of the town.

Our second ground was rather a more extensive one, but it may be said to be to the right and left of the paths through the woods leading to the Echo and St. Leonhardts. The best way of reaching this ground is from the western end of the town past the English church, past a little place called Klein Verseilles, straight up a valley with grass in the middle and wooded on each side. At the top of the hill is an open bit of ground with several piles of timber, and is a sure resort for *Argynnis lathonia*.

Our third, and I think best, ground we only discovered towards the end of our stay, and I am sure it would well repay

more careful working. The best part is about three miles from the Schloss-platz, along the road to Marienbad to the south-east; in fact the road follows the river, and if you walk up stream you cannot miss it. The best part begins just where another road branches off to the left towards a mill on the river, but you must keep straight on along the steep bank on the right. If the weather is fine you will soon be busy, for this is a locality where *Apatura iris*, *L. populi*, *Papilio machaon*, *Vanessa c-album*, *Argynnis paphia*, and many others may be found, either enjoying some muddy spot left from the last shower of rain, or flitting from flower to flower. The best time to begin is 11 a.m., as we found repeatedly that it was perfectly useless working one's ground before that hour.

I will now give a list of the species captured, and the following notes are intended to give shortly the date and locality. I have adopted Dr. Staudinger's nomenclature and classification:—

Papilio machaon.—I obtained one specimen on the Marienbad road on July 3rd, hovering over a flower of the common parsnip.

Pieris napi, *P. rapæ*, *P. brassicæ*.—The two former were abundant on and after July 9th; *P. brassicæ*, however, appeared in fair numbers on the 11th.

Leucophasia sinapis only put in an appearance twice about June 29th, when we captured two specimens.

Of *Thecla pruni* we saw and captured a few on June 29th, on the brambles growing on the road-side beyond the cemetery.

T. rubi also was in poor condition and rare on July 10th.

The genus *Polyommatus* was represented by no less than five species:—

P. virgaurea.—It would be difficult to name a suitable locality where the males of this beautiful species did not abound;—in the little valleys surrounded by sombre pines on the Marienbad road; in the forest glades he is alike at home, at one moment exploring the hidden sweets of some favourite flower, at another disturbed by your careless step he vanishes with the peculiar flight of his race, just allowing one glance of his brilliant hue. We observed the male in scanty but increasing numbers up to July 5th, after which he was very common. The females, on the contrary, were very rare, having caught but four; the first on June 26th, the last on July 12th. Whether the females emerge from the pupæ later on, or whether from less obtrusive habits and

colouring they escaped our notice, I am unable to say. But I do know that we searched most diligently, and considered it a red-letter day when one fell to our net.

P. hippothoe was very rare; we caught only three on and after June 25th.

P. alciphron was rather more numerous than the preceding, but difficult to obtain in good condition; however we managed a nice series. One rather marked variety occurred:—On the under side of the right wing the spots were of normal size, but on the left unusually large; on both hind wings the two upper spots of the inner submarginal row were very large and pear-shaped.

P. phlaeas occasionally put in an appearance, but nowhere in large numbers.

Of *P. dorilis* we only took one specimen.

The genus *Lycæna* was fairly well represented, for we took nine species; but the thrifty habits of the peasants sadly interfered with our success: just as the “blues” were most abundant they set to work to cut and make hay of the coarse grass on the road-side, thus effectually spoiling the locality. In spite of this drawback the Marienbad road yielded—

L. argus, *L. medon*, and *L. hylas*, the latter in fair abundance on July 10th.

On the 11th my brother took one fine specimen of *L. meleager*.

L. amanda was fairly plentiful, but in very bad condition.

We took a few good specimens of *L. ægon*, on and after July 4th, beyond the cemetery and on the path leading to the Echo.

L. optilete is a very local species, but in fair numbers where it does occur. The only place where we met with it was on the top of the hill to the right of the path, among the young pines. Instead of going straight on up the valley leading to the Echo we turned to the right, keeping Klein Verseilles on the left and a large sandpit on the right; after passing the sandpit the path bends rather to the left and runs along the crest of the hill. It is very curious that, although the food-plant, *Vaccinium oxyococcus*, is most abundant elsewhere, this was the only locality where *L. optilete* occurred. Good specimens were scarce, on account, I suppose, of the young pines.

L. acis = *L. semiargus*.—A very common insect from June

25th to July 2nd, when it appeared to be on the wane. Amongst the long grass, at the upper part of the valley leading to the Echo, it was particularly abundant. In some specimens we noticed a tendency to vary on the under side. A male we captured has on the left upper wing two spots, shaped like the figure 8, between the discoidal spots and the usual row of black spots. In the female the basal spot is sometimes absent, and there is a faint trace of a marginal row along the hind margin of the hind wing.

L. arion we found in two localities. We took a fair number of this beautiful insect, but it was by no means so plentiful as the preceding. The valley leading to the Echo and the cemetery, or rather the road a little beyond, divided the honours between them from July 9th to July 11th.

Of *Apatura iris* I caught two males,—one under the pine woods beyond the cemetery on July 9th, the other on the Marienbad road on July 11th. The mud on the road proving irresistible, I made an easy capture.

Limenitis populi.—We took six of this graceful species, but I think we must have seen seven or eight more. Like *A. iris* it is fond of damp situations, but in more sheltered places, such, for instance, as the junction of two or more paths, where the trees throw a net-work of light and shade upon the damp ground. Sometimes a more open spot is chosen, but nearly always under or in the shade of some overhanging bush or tree. The female is very difficult to get uninjured, as very often there is a large piece taken out of the hind wings. Probably the large size and conspicuous markings make her a tempting prize for any passing bird. Date of appearance from June 25th to July 11th. We took one specimen of the male variety, figured by Dr. Lang as var. *tremulæ*.

The *Vanessidæ* were not absent:—

Vanessa urticæ was first observed near the Echo on July 2nd, and gradually increased in numbers.

My brother took *V. c-album* at rest on a pine branch as early as June 29th, but evidently it had hibernated. After July 4th it occurred more frequently, especially on the Marienbad road; and I have no doubt would, later on, be an abundant species in that locality.

I observed the larva of *V. io* feeding with *V. urticæ* on the common nettle.

We saw but one *V. atalanta* on July 10th.

V. cardui was common during the whole of our stay, but in very poor condition.

Melitæa didyma was met with only once, and that in bad condition, on the Marienbad road, July 12th.

M. athalia was in great abundance everywhere between June 27th and July 3rd.

M. dictynna, a nearly allied species, which I think succeeds *M. athalia*, occurred, but not in such profusion. We took a dark form of the female.

Argynnis selene was first taken on June 25th. On June 27th it was a perfect pest in every open glade; but after July 3rd we seldom saw any but worn specimens. My brother took a curious variety, which I believe is very uncommon, and may be roughly described as follows:—On the upper side of the fore wings the three basal spots form an irregular blotch of black; next to this, on the costal margin, is an oblique discoidal spot, then a row of black spots crossing the wing, much greater in width than height. The outer row of brown spots are retained on the hind margin, but their black setting in some cases joins the row I mentioned above. Hind wings black, with outer marginal row of seven brown spots. On the under side the markings of the fore wings nearly correspond with the upper side. The hind wings are remarkable for their dusky ground, throwing out the silver spots, which are altogether abnormal. The hind margin has the usual brown spots.

On July 10th and 12th we took five of that pretty little insect, *A. dia*. The chief locality was a sheltered hollow, on the right hand of the Marienbad road, where a white bedstraw, or *Galium*, was in full bloom. I do not think anyone would pass it unnoticed. The best plan is to stand on the hill-side above, so as to be prepared to swoop down on one's prey; but if this species is missed the first time, the chances are she will have the best of it over broken ground.

A. amathusia.—We took only one specimen, near St. Leonhardts, a female, on July 7th, which was rather a pretty variety.

A. ino was hardly less abundant than *A. selene*, both of them appearing at very nearly the same time. It was first seen on June 29th. By July 3rd the flight was over, for we met only with worn specimens.

A. lathonia was common, but not abundant, and was difficult to get in really good condition. The males were greatly in excess of the females. The grass banks and paths which separate the fields, in fact any bit of short grass, was almost sure to yield one or two. I remember one exception, having taken within a few yards no less than five, one of which was the largest female I ever saw.

The males of *A. aglaia* were abundant from July 4th, while the females were comparatively rare, although later on they became more common. Localities, Marienbad road and cemetery.

A. niobe.—We secured a few specimens of this beautiful species on the Marienbad road, on July 10th; and the var. *eris* was to be met with about the same date in the same locality, as well as beyond the cemetery.

A. adippe corresponds with *A. aglaia* in locality, but rather later.

Of *A. paphia* I took one specimen near St. Leonhardts, and another near the Echo; but the best locality was the Marienbad road, just before and beyond the spot where I took *A. iris*. First seen July 7th; still in capital condition when we left.

Melanargia galathea was abundant round a pond near St. Leonhardts. It was first seen on June 30th in considerable numbers, also later, on the Marienbad road. We took one slight variety, with only three, instead of four, spots on the under side of the hind wing.

Erebia medusa was met with in fair numbers just beyond the cemetery, and to the left of St. Leonhardts.

E. œme.—One specimen only.

Satyrus alcyone was just coming out when we were leaving. I took three on the Marienbad road, July 12th.

Pararge hiera was fairly plentiful near the cemetery, though difficult to get in good condition. First seen June 25th, when the flight appeared to be getting over.

P. ægeria var. *ægerides* was observed on June 30th, but we never took one in good condition, nor saw the type, *P. ægeria*.

Epinephele janira was common everywhere.

E. hyperanthus was equally abundant. The most marked variety was a male with two spots on the under side of the fore wing.

Cænonympha iphis was very common everywhere from June 25th.

C. arcania was fairly plentiful on the Marienbad road.

C. davus was not numerous.

A few specimens of *Syrichthus serratulæ* were taken on the Marienbad road, on July 10th.

Hesperia linea and *H. sylvanus* were very common in suitable localities; the first preferring the woods, the other the open country.

The Heterocera we never attempted to work, but observed the following:—*Sesia culiciformis*, *Procris statices*, *Zygæna minos*, *Z. trifolii*, *Z. filipendulæ*, *Euthemonia russula*, *Chelonia plantaginis*, *C. caja*, *Bombyx quercus*, *Boarmia repandata*, *B. abietaria*, *Melanippe albicillata*, *M. hastata*, *Anaitis plagiata*, and many others.

The climate of Carlsbad is subject to sudden and great variations of temperature, but we were exceptionally favoured.

The cost of living, lodging, &c., is moderate up to the middle of July; after that the English season begins, and everything costs about double.

I ought to mention that a friend told me that *Vanessa antiopa* may be taken at Carlsbad occasionally.

ON THE METHODIC HABITS OF INSECTS WHEN VISITING FLOWERS.

BY ROBERT MILLER CHRISTY.

[It having been thought desirable that the readers of the 'Entomologist' should be provided with a summary of the conclusions arrived at as the results of my somewhat lengthy observations on this subject, which have already appeared, I have pleasure in publishing the following remarks, which are extracted from a paper of mine, read before the Linnean Society on March 1st, 1883, and published in the Society's Journal ('Zoology,' vol. xvii., p. 186). As the details of my observations have already been given so fully, it has not been thought necessary to reproduce the tables published by the Linnean Society, in order to show more clearly at a glance the result of the observations, although the following remarks are, to some

extent, an examination of these tables, which show the number of species visited by each insect, the number of visits paid to each of these species, the total number of visits paid to flowers whilst the insect was in view, the order in which the species were visited, the colour of their flowers, and the number of visits paid consecutively to each species.]

The perusal, in 1881, of Mr. A. W. Bennett's paper, "On the Constancy of Insects in their Visits to Flowers,"* first led me to pay attention to the matter; and I hope that my altogether independent observations will be found to supplement and corroborate his. Throughout all my observations I have endeavoured to adopt a method of procedure precisely identical with that described by Mr. Bennett. I regret that some of my earlier observations were not made so systematically as the later ones, and that I have been unable to distinguish between nearly all of the various species of humble-bee and between some of the species of plants. Altogether I am able to record the movements of 76 insects whilst engaged in visiting at least 2400 flowers.

No one, I think, who takes the trouble to wade through the details will deny that there is apparent in very many, if not in most of them, some powerful influence at work which induces insects, where possible, to continue visiting for a considerable time continuously the flowers of the same species of plant, neglecting meanwhile all other sorts. Of course it is utterly impossible to say (without perhaps a microscopical examination of the pollen a bee brings home) whether one insect on one flight from its hive or nest confines itself exclusively or principally to one species of plant; but, according to my observations, there seems to be great probability of its so doing.

So far as Table I. goes, it will be seen that the hive-bee is *perfectly* methodic in its habits; and it seems therefore to follow that this is the most valuable species to plants, and is also probably, on account of its methodic habits, enabled to get through the most work. Both my observations on this point and Mr. Bennett's lead to almost exactly the same conclusion.†

* Read before the York Meeting of the British Association, 1881.

† Since the foregoing was written, however, I have observed a hive-bee that was not perfectly methodic. Near Saffron Walden I saw one visit *Anemone nemorosa* 1, *Ranunculus ficaria* 1, *Anemone nemorosa* 1, and *Ranunculus ficaria* again once, and

It would be interesting to ascertain whether the Ligurian bee or Mr. Blow's newly-introduced Cyprian bee, both of which are said to be more productive than our common hive-bee, are equally methodic—they could hardly be more so. Eight insects which I watched visited altogether eight species of flowers 258 times, or an average of about 32 flowers each. This species of bee is so perfectly methodic, that when I have carefully watched (as in observations No. 26 and 29) a number of individuals visiting frequently a variety of different flowers growing together, I have never yet been able to see a hive-bee change one species of flower for another; on the contrary, as in my best observation (No. 32), I have often seen flowers of another species, although often of the same colour, obviously rejected.

Table II. (Lepidoptera) shows a considerably greater degree of constancy than it would have done, judging from Mr. Bennett's observations, had I watched a larger number of species. In this class Mr. Bennett and I have, with two exceptions, observed different species. As it is, 12 individuals which I have had under observation have visited 99 flowers belonging to 15 species; but 94 of these flowers belonged to 12 species.

Table III. shows a fairly high degree of constancy or method on the part of the humble-bees, as 46 insects, of whose movements I have exact details, visited 1751 flowers belonging to 74 species; but 1605 of these flowers belonged to 46 species, 1733 belonged to 65 species, 1745 belonged to 70 species, and 1750 belonged to 73 species. Taking all my 55 observations together, it will be seen that one insect visited, whilst kept in sight, no less than 5 species of flower, 3 visited 4 species, 4 visited 3 species, 18 visited 2 species, whilst 29 (or rather more than half) visited one species only.

It will be observed that most of my observations have been made upon bees, which seem to me to perform the fertilization of at least one-half of all the flowers which are fertilized by insects in this country. As to butterflies I have seldom seen one whose

it was then lost. The only other flower out around was *Primula vulgaris*. This was very early in the spring (April 6th), at which time, as in the autumn, as I have now reason to believe, bees are less systematic than at other times. The season this year, at the date named, was exceedingly unfavourable for bees, and very few flowers were out.

flight gave me the idea that the insect had the least notion as to where it was going. Generally their movements seem purposeless. Nevertheless some species, including the Fritillaries, are fairly methodic. Among the high Alps of the Canton Grisons, however, where some of my observations have been made, there are very few bees when compared with what we have in England, whilst the number of butterflies and moths is so great that it hardly bears comparison with the number here. I presume, therefore, that a large number of plants growing on the Alps are fertilized by Lepidoptera, although I have only a very few observations to that effect, as insects of this class are most difficult and unsatisfactory to watch.

We have now seen that insects do possess a decided preference for a number of successive visits to the same species of flower, although this is not invariably the case. It is quite needless here to treat of the great importance of this fact to the plants themselves, or of the numerous variations and modifications of colour, form, scent, and other particulars which the plants appear to have effected in their flowers with a view of inducing the insects to be thus methodic in their habits. I cannot doubt that Mr. Darwin is right when, in speaking of the probable reasons why insects are methodic, he says ('Cross- and Self-fertilization of Flowers,' p. 419):—"The cause probably lies in the insects being thus enabled to work quicker; they have just learnt how to stand in the best position on the flower, and how far and in what direction to insert their proboscides. They act on the same principle as does an artificer who has to make half a dozen engines, and who saves time by making consecutively each wheel and part for all of them."

Although so little is really known as to the sight of insects, Sir John Lubbock's observations have satisfactorily established the fact that bees can distinguish some at least of the colours, and that they show a preference for *blue*. Colour, however, is not the only sense which guides insects from one flower to another of the same species, although I believe it largely does so. Some other sense must have been called into use in observation No. 43, where a small humble-bee visited 15 flowers of *Digitalis purpurea*, some being white and others coloured; in observation No. 57, where a specimen of *Pieris brassicæ* visited flowers of *Geranium* which were both scarlet and pink; and in observation

No. 48, where a small humble-bee visited many times both red and white flowers of the same species of *Trifolium*. It is just possible that in these cases a sense of smell may have assisted.

During my observations on bees I have come to the conclusion that they have a *good* sight for short distances, but a *poor* sight for long distances. Often when visiting small flowers growing many on a plant, I have seen a bee reach out and, pulling down the next nearest flower, insert its proboscis. Their general movements whilst actually visiting flowers lead me to the belief that they see precisely what they are doing whilst so engaged. But if a bee be watched whilst not in the act of visiting a flower, its movements will be seen, I think, to be different. A bee seldom flies straightly and directly from one flower to another unless the second be very near the first, or so conspicuous that the bee can hardly help seeing it. On the contrary, a bee generally goes prowling about over the leaves, grass, or herbage with an irregular zigzag line of flight until it comes within sight of a flower belonging to the species of which it is in search. Then, too, a bee which is being watched will generally allow anyone to approach it closely, provided this be done steadily and quietly; but if approached roughly or quickly the bee flies off at once.

In opposition, however, to what has been already advanced as to the methodic habit of bees, I have several facts to bring forward. Bees very often do not seem to be at all systematic as to the number of times they visit the same flower, but often visit a flower more than once, as stated in observations Nos. 3, 21, and 43, but especially in No. 10. In No. 20 I even caused several heads of *Scabiosa succisa* to be twice visited by picking and again presenting them to the bee. My earlier observations, which were made in the autumn of 1881, seem to show that bees are less methodic at that time of year than in spring and summer, when many of my later observations were made, probably because there are fewer flowers then out. It is said that bees are unable to distinguish between some closely-allied species of flowers, such as *Ranunculus bulbosus*, *R. acris* and *R. repens*, and *Trifolium fragiferum* and *T. repens* ('Cross- and Self-fertilization of Flowers,' p. 416); and it is very possible that hybrids are thus formed, as in the genera *Verbascum* and *Primula* ('Forms of Flowers,' pp. 55 and 75). It is further noticeable in several of my observations (Nos. 34, 48, 55, 63, 68, and 70) that just before

I lost sight of my bee altogether it appeared to become wild, and paid a visit to some flower of a fresh and altogether different species (irrespective of colour), afterwards flying right away, although it had been perfectly methodic previously. I wish to refer also to observations Nos. 3, 4, 27, and 28. In all these cases humble-bees paid many visits to two different species of flower at the same time, passing alternately, without respect to colour, from one to the other after several visits. It is obvious that what has been just said does not apply to these individuals; and I can only account for their movements on this supposition, that if bees often visit one species of flower many times consecutively, because they can thus remember from one flower to the next the best way to alight and to reach the nectar of that particular species, so saving time, then these bees were a little more highly intellectual than their fellows, and could manage to work the two species together, although I should fancy more than two would puzzle them. Nevertheless there can be no doubt that insects, more often than not, do their work in the manner which I have spoken of as "methodic" or "constant," although the extent to which these habits are developed varies greatly in the different classes of insects, and even in the different species.

With Table III. before me, and bearing in mind the fact that bees show a preference for the colour blue, I have endeavoured to ascertain whether my figures show that bees are more methodic when visiting blue flowers than when visiting flowers of other colours. Unfortunately all my observations on the honey-bee have been made when the insects were visiting yellow flowers, so that nothing can be learnt from them; but of all the 55 humble-bees watched, no less than 26 visited more or less blue flowers, of which 12 were perfectly methodic, 9 were nearly so, and 5 not at all. Thirteen insects visited white flowers, of which 5 were perfectly methodic and 8 not at all; 11 visited yellow flowers, and 4 were perfectly methodic, 1 nearly so, and 6 not at all; 28 visited red flowers, and 7 were perfectly methodic, 9 were nearly so, while 12 were not at all; so that by this scale of comparison humble-bees are shown to be more methodic when visiting blue flowers than when visiting others; but this may be a mere coincidence. Further observation alone can decide the question.

TWO NEW SPECIES OF THE GENUS *COLEOPHORA*
ADDED TO THE BRITISH FAUNA.

BY WILLIAM MACHIN.

COLEOPHORA VIBICIGERELLA.—I have pleasure in recording the occurrence of a fine specimen of this insect, which is new to England. It was taken by myself in a garden near Fobbing, Essex, in June last. The insect was observed on a leaf of *Convolvulus major* in a hedge, opposite a plant of *Artemisia vulgaris*, on which its larva had probably fed. Not recognising the species I sent it to my friend Mr. Warren, who stated he believed it to be the above-named species (which opinion Mr. Stainton confirmed), and that its larvæ feed on *Artemisia campestris* and *A. vulgaris*. Subsequently I went to search for the larva, but my friend had cut down the plant. I have searched in the immediate neighbourhood, where I found a fair quantity of plants of *A. vulgaris*, but have not succeeded in detecting its larva. I found no plants of *A. campestris*. This insect belongs to the *Vibicella* group, and bears some resemblance to a small specimen of *Coleophora conspicuella*.

COLEOPHORA MARITIMELLA.—This new species (lately named by Mr. Stainton) is one of the *Troglodytella* group of the genus *Coleophora*, but is smaller than that species, the wings more pointed, and darker at the apex. The young larvæ are hatched in the autumn, and again commence feeding after hybernation, early in the year, causing whitish blotches in the leaves of *Artemisia maritima*, but few attain their full growth till the end of June or beginning of July; the imagines appearing in August. The case is similar to that of *C. troglodytella*, but I think rather more slender. The larvæ appear to be widely distributed over the salterns near the Thames estuary, but is nowhere common. My first meeting with it was on the sea-wall at Thames Haven, but this wall suffered so much from the great snow-storm and gale, two years ago, as to need extensive repairs; and on visiting the place the following autumn I found the wall had been repaired for about a mile, and all trace of the wormwood which had grown there in plenty was entirely obliterated.

SALE OF THE LATE DR. HARPER'S LEPIDOPTERA.

THE sale of a portion of this remarkable collection of Lepidoptera took place on the 20th and 21st of March last. The late Dr. Harper had amassed a very large number of the choicest varieties of moths and butterflies, and consequently the competition was spirited, and the prices paid were probably higher than have ever previously been given for Lepidoptera. The greater portion of the first day was occupied by the disposal of the Diurni. A fine variety of *Papilio machaon*, bred by Mr. Kay, of Bury, realised £4 5s.; the series of the genus *Colias* reached £24 9s.; one specimen of *Vanessa io*, with obliterated ocelli, sold for £4 10s.; and a black variety of *Limenitis sibylla* for £3. The total of the sale of butterflies alone amounted to about £220.

Among the Nocturni, the rarer clearwings caused a sharp competition; and a *Sesia vespiformis*, from the Waring collection, reached £3 5s. The Shetland series of *Hepialus humuli* var. *hethlandica*, forty-nine in number, went for £10 10s. Perhaps, with one exception, the highest prices paid for a single series was that of *Chelonia caja*, sold in fifteen lots, which reached a total of £92; and two varieties of *C. villica* went for £5 and £4 10s. respectively. *Orgyia cænosa* were sold at £7 7s. for a series of thirty.

It was amongst the Geometræ that the highest prices were obtained, both for series and individuals, during the two days' sale. The single specimen of *Nyssia lapponaria*, unique as a British species, was purchased by Mr. E. G. Meek for £13 13s. It would probably have been sold for a much larger sum, had not one of the competitors understood that it had been knocked down to him, and so ceased bidding. The series of *Boarmia repandata* went for £6 18s.; the var. *sodorensium* being eagerly bid for. In fact all the varieties, of even common species, taken in the Orkneys, Shetlands, or Hebrides, commanded high prices. Great interest was shown in the crowded room when *Abraxas grossulariata* was reached. These were divided into twenty lots, containing many remarkable varieties. There were amongst them about a dozen of the banded variety (fifth figure in Newman's 'British Moths'); and these were distributed, with

many others, over the lots. The total obtained for the series of *A. grossulariata* was upwards of £100; lots of ten specimens ran from £6 6s. to £7 7s. each. The genus *Eupithecia* went for £14; but this was not at all a high price, there being no less than 1136 specimens, including local forms.

For the Noctuæ the bidding was good, but perhaps not so high as in the former classes: for instance—*Noctua subrosea* went at, lot after lot, £2 per pair; the two *Xylina zinckenii* were not dear at £1 10s. each; *Heliothis scutosa* went for £3; whilst the unique *Catocala electa* reached £5 5s. The total of the first two day's sale was £896 for insects alone.

Amongst the larger buyers were Mr. E. G. Meek, no less than 221 lots for £422; others were M. Oberthür (Rennes, France), Messrs. Janson, Sydney Webb, C. A. Briggs, J. H. Leech, A. B. Farn, Rimington, Bird, Sabine, Wheeler, J. H. Clark, Howard Vaughan, S. Stevens, W. de V. Kane, H. A. Adams, Dr. Battershell Gill, Dr. Mason, Major Elwes, and Lord Walsingham.

It is impossible, with the space at our command, to give anything like a description of the various lots; but one cannot help remarking upon the magnificent collection of the genus *Colias*, which, it will be remembered, was shown at the Entomological Exhibition held at Westminster a few years ago. Many of these were figured in this Magazine; and the wonder is that these went at so small a price, when compared with other lots.

The Micro-lepidoptera still remain to be sold; and as they consist of the late Thomas Wilkinson's (Scarborough) collection, and many others, no doubt the sale, which will take place during May, will attract much attention. This latter portion of the late Dr. Harper's Lepidoptera appears to be even more important than that already disposed of, for it contains more perfect series of the various species than he possessed of the Macro-lepidoptera.

J. T. C.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ENTOMOLOGY IN SOUTH LONDON: A GOOD SEASON.—As a drop of consolation in the ocean of discontent, caused by the continuous bad seasons, and the notable failure during the past season of some of our best hunting-grounds, *e.g.*, the New

Forest, I have enumerated below the various species of Macrolepidoptera taken by me during the last year on a small piece of private ground, less than an acre in extent, and containing about ten yards of whitethorn hedge and one poplar tree, the said piece of ground being, I believe, within three miles of London Bridge on the south side. The Diurni were not numerous, being represented by *Pieris brassicæ* and *P. rapæ*, and their larvæ; *Vanessa urticæ*; and the larvæ, but no imagines, of *V. atalanta*. Among the Nocturni were *Smerinthus populi* and its larva; three of the genus *Arctia*, viz., *A. caja*, *A. lubricipeda*, and *A. menthastri*; and the larva of *Nola cucullatella*. The Geometræ were fairly represented, as I noted the occurrence of twelve species, viz.:—*Rumia cratægata*, *Crocallis elinguaris*, *Hemerophila abruptaria*, *Boarmia rhomboidaria* with its variety *perfumaria*, *Acidalia scutulata*, *A. incanaria*, *Halia wavaris*, *Abraxas grossulariata*, *Eupithecia centaureata*, *E. vulgata*, *Camptogramma bilineata* and its larvæ, and *Eubolia mensuraria*. The Noctuæ were more numerous than any other family, and form quite a surprising list for so limited an area. Nearly forty species were present in more or less numbers, some of them being far from scarce. Among them were *Acronycta psi* and *A. megacephala*; five of the genus *Leucania*, viz., *L. conigera*, *L. lithargyria*, *L. comma*, *L. impura*, and *L. pallens*, the latter two being very numerous. Those ubiquitous species, *Xylophasia lithoxylea* and *X. polyodon* were well represented, as were also *Mamestra brassicæ* and *M. persicariæ*, and an occasional *Dipterygia pinastri*. Four of the genus *Apamea* were visible, viz., *A. basilinea* and its larvæ, *A. ophiogramma* (but one), *A. gemina*, and *A. oculatea*; also *Luperina testacea*; three of the genus *Miana*, viz., *M. strigilis* in three different forms, *M. fasciuncula*, and *M. literosa* (only one of the latter, however, being seen); *Caradrina morpheus*, *C. cubicularis*, *Agrotis exclamationis*, *A. segetum*, *Triphæna pronuba*, *Noctua c-nigrum*, *N. xanthographa* and its larva, *Anchocelis pistacina*, *Cerastis vaccinii*, *Xanthia ferruginea*, *Tethea subtusa*, *Cosmia trapezina*, *Euplexia lucipara* and its larva; three of the genus *Hadena*, viz., *H. chenopodii*, *H. pisi*, and *H. oleracea*; *Plusia gamma*; and a very fair number of unknown species among the Microlepidoptera. True, with the exception of *A. ophiogramma*, the list contains no rarities; but the very fact of one individual, a comparative

beginner, taking between sixty and seventy species so near home, in such a locality, and in an acknowledged bad season, ought to act as a relief to our despair, and a spur to further exertions in more suitable places during the coming collecting season.—T. W. HALL; New Square, Lincoln's Inn, Jan. 3, 1884.

A BANK HOLIDAY IN 1883 AMONGST LEPIDOPTERA IN CAMBRIDGESHIRE.—At this time of the year reminiscences of the past and anticipations of the future occupy no small portion of our time and thoughts. It is of the former that is suggesting the following little account of a most enjoyable day spent last August in my native county. Rather late in the forenoon I approached, in company with a young enthusiast, the scene for an instructive and pleasurable day of observation amongst the Lepidoptera of our county. On the slopes and flats of a somewhat down-like country our attention was drawn to the luxuriance of *Galium* in full flower, and presenting a most attractive appearance. We had not proceeded far before specimens of *Lycæna corydon* appeared in rapid succession. We were soon at work, and before long found that we had been fortunate in capturing good specimens of the following:—*L. corydon*, *Satyrus semele*, *S. tithonus*, *Polyommatus phlæas*, *Hesperia comma*, *Eubolia bipunctata*, *E. lineolata*, *Fidonia atomaria*, *Leucania comma*. The principal notes of observation I made were these:—That *E. bipunctata* invariably flew in pairs, and generally amongst a flight of *L. corydon*, making it at first a little difficult to distinguish them; but being stronger and more rapid on the wing we were soon alive to them, and successful in our captures. Next I noticed that several of *H. comma* were infested with a brilliant scarlet parasite, in appearance, and in form like a lady-bird. I kept a few specimens in glass-topped boxes, and found that the merciless parasites before long relinquished their prey, under the influences of their unexpected confinement.—HAROLD ARCHER; The Close, Ely, January, 1884.

GONEPTERYX RHAMNI AND ITS FOOD-PLANTS.—Mr. Sladen's experience of *Gonepteryx rhamni* by no means coincides with mine. Here, in East Cheshire, *Rhamnus catharticus* is by no means common, and *R. frangula* is only grown in a few gardens; but the scarcity of *Rhamnus* is much exceeded by that of *Gonepteryx*. During about fifteen years' collecting in this

neighbourhood I have only observed two specimens of this insect, and both of those were seen at least twelve years ago. Several times, also, I have spent the month of August at Bournemouth, when I found *Rhopalocera* generally abundant; but there *G. rhamni* was far from common. Indeed it was not until the summer of 1880, when I visited the New Forest, that I ever saw *G. rhamni* in abundance.—H. H. CORBETT; Ravenoak, Cheadle Holme, Stockport, February 20, 1884.

ZEUZERA ÆSCULI.—I met with several larvæ of *Zeuzera æsculi* at Cambridge the year before last, but unfortunately failed to rear any of them. Can any of your correspondents suggest the best means?—ALBERT H. WATERS; Mill Road, Cambridge.

NOCTUÆ NEAR CAMBRIDGE: ACRONYCTA RUMICIS.—This species was very plentiful here in 1881, but has been scarcer ever since, and last year was not at all common. *Acronycta aceris*, too, which I always find in some abundance here, was in fewer numbers than usual. The only other Noctuid I met with worth mentioning were *Acronycta ligustri*, *Miana furuncula*, *Caradrina blanda*, *Agrotis puta*, and *Plusia chrysitis*, together with *Noctua c-nigrum*, the second brood of which was common in September.—ALBERT H. WATERS; Mill road, Cambridge.

EARLY APPEARANCE OF EPIONE ADVENARIA.—I think it may be interesting to some of your readers to hear that two of the above-named species are already on my setting-boards, the first having appeared on the 10th, and the second on the 14th, of March. They are from a batch of six that were reared from eggs. Is there usually an earlier brood than the July one mentioned by Newman?—PERCY RENDALL; 20, Ladbroke Square.

REMARKABLE NEST OF A CONGREGATING MOTH.—At the last meeting of the Linnean Society, March 20th, in illustration of his paper, "A Contribution to the Knowledge of the Genus *Anaphe*, Walker," Lord Walsingham exhibited a large and remarkable nest of a congregating moth, a species of the genus, from Natal. It contained a packed mass of cocoons, specimens of the larvæ, and of the mature insect. There likewise was shown a living example of a dipterous parasite, which had emerged from the moth-eggs on hatching. His lordship stated that the nest and contents had been forwarded to him by

Col. J. H. Bowker, of Durban, and that the larvæ were found alive on its receipt in England in August last. The nest was placed in the insectarium in the Zoological Gardens, Regent's Park, under the care of Mr. Thompson, and who was fortunate in rearing some of the insects. Many of the larvæ remained in the nest, but others, in companies of twenty to forty, occasionally marched out, moving in closely serried ranks, much after the manner of the larvæ of the procession moth (*Cnethocampa*). From December to February about 250 moths emerged, but from the difficulty of obtaining their natural food all died, though a pair bred and the eggs were hatched. The mature insect closely resembles the *Anaphe panda*, Boisd., though under the latter it would seem are several well-marked local races. The genus is found in West Africa, as well as Natal; but it appears that in the several species the colour, size, shape and material of the common nest, as well as the individual silky cocoons, markedly differ. Doubtless the habits of these moths, when still more fully known in their native haunts, will yet form a most interesting chapter to the traveller. Of *Anaphe* four species have hitherto been described, viz.:—*A. venata*, from Old Calabar; *A. ambigua*, from Angola; *A. reticulata* and *A. panda*, from Natal. To these Lord Walsingham adds—*A. carteri*, from the Gold Coast; and *A. infracta*, from the Cameroons.

IMPORTATION OF EPHESTIA PASSULELLA AND *E. FICULELLA* TO KING'S LYNN.—On February 6th I was informed that numbers of small moths were flying about a vessel which had just arrived here from Galveston, America (Texas), with a cargo of decorticated cotton-cake. On the same day a few of the moths were brought me, and at the time I thought them to be *Ephestia passulella*; but subsequently noticing that they varied considerably a few of them were sent to Mr. C. G. Barrett, from whom I learn that there are two species, viz., *E. passulella* and *E. ficulella*. On the following day (the 7th) I visited the vessel, and found that these moths were absolutely swarming in the hold amongst the cargo. Numbers of them continually issued through the hatchways into the open air as the cargo was being discharged. Cocoons, doubtless of these species, were plentiful on the outside of the bags in which the cotton cake was packed, and larvæ were also observed both without and within the bags. The cake has been stored in warehouses about the town, and I hear that it is

not likely to be disturbed for some months, in which case I anticipate that these two species will obtain a permanent footing here. Two years ago *E. passulella* was plentiful in and about the warehouses belonging to the dock company; but last year, although a search was frequently made, no trace of this insect could be found: probably the cake, or whatever the larvæ might be feeding upon, was removed from the warehouses. If this supposition be correct it would be quite sufficient to cause the insect to become very scarce, and thus account for its apparent absence last year.—EDWARD A. ATMORE; Exton's Road, Lynn.

EXAPATE GELATELLA IN SURREY.—At page 44 of the present volume of the 'Entomologist' a note occurs by Mr. Porritt, in which he states that this species was excessively abundant at the end of last October and beginning of November in certain northern parts of England. As a supplement to this information it may be interesting to record its capture at New Malden, Surrey; for although I have collected in this district for many years yet I never met with, or heard of, its being taken until December 2nd, when one flew into my umbrella. I also took another quite fresh from the pupa a fortnight later. Considering where its head-quarters are situated, it seems strange that this moth should have turned up here at all, but more especially that it should be six or seven weeks after its appearance in the more northern and colder part of the country.—H. T. DOBSON, jun.

IRREGULAR EMERGENCE OF LEPIDOPTERA.—During last October, November and December I took several larvæ of *Phlogophora meticulosa* on geraniums in the open and in a greenhouse. About the middle of December some of the first I took spun cocoons just under the surface of the earth placed in the breeding-cage. On February 4th, when I was placing fresh geranium leaves in the cage, I was surprised by finding a fine female on one side of the cage. Another appeared on the 7th inst.; and fifteen in the course of the next five days. There was no fire in the room where they were kept until about a fortnight before the appearance of the first on the 4th inst.—A. DRUITT; Christchurch, Hants, February, 1884.

PARONYMIC NOMENCLATURE.—At the last meeting of the Entomological Society, March 5th, Mr. J. W. Dunning, President, called attention to a paper entitled "Description of a *Pieris* new

to Science—*Pieris spilleri*, mihi," by A. J. Spiller, published in the 'Entomologist,' vol. xvii., p. 62. The species was taken in Natal in 1881 by Mr. Spiller, and he seems to have taken some pains to ascertain that it was nondescript:—"I beg therefore to name it after myself." The practice of naming a new species after its captor, simply because he first captured it, was to be discouraged: "names taken from persons should not be lightly applied; this distinction should be reserved for those whose works and scientific labours give them a claim to the admiration of posterity." The story, at once ludicrous and melancholy, of *Æcophora woodiella*, as narrated by Mr. Sidebotham (Entom. xvii. 52), should be a warning to nomenclators against the hasty imposition of personal names. If the attempt of one entomologist by this means to confer honour (often undeserved) upon another may be excused, what can be said for the man who is not content to wait till the compliment is paid him by another, but insists upon crowning himself? The President believed the case to be without precedent, and, as it was certainly a departure from good taste, he trusted Mr. Spiller would not find an imitator.

BLATTA AMERICANA.—Besides the *Ephestiæ* noticed (p. 93) as having been recently imported from America, I observed a number of *Blatta americana* (American cockroach) amongst the cargo of the same vessel. They were to be seen in various stages of development, some of them being as yet very small; others, although to all appearances full-grown, were still of a whitish colour, whilst not a few possessed the red colour characteristic of the fully-developed insect. Although they seemed to be very active, I hope that our climate will prove unsuitable for the naturalisation of this destructive pest.—EDWARD A. ATMORE.

BIRDS VERSUS INSECTS. — Birds undoubtedly have great influence in lessening the number of individual insects. All insectivorous birds feed principally if not entirely upon insects. Small birds have increased very much in numbers in this neighbourhood since the Wild Birds' Protection Act. I have taken notes of nests and eggs which I have found, and find that lately they have been more numerous. Birdcatchers used to catch scores of young goldfinches and linnets here before the passing of the Act. I can well remember the time when farmers in this district used to purchase birds' eggs, young birds, and the heads

of old birds, for a small nominal sum. This sadly decreased the birds; in fact, so much that many periodicals of that day lamented their destruction. A worse result, however, came to the farmers. The rapid multiplication of many species of insects caused serious damage to crops and other kinds of produce. The birds were eventually suffered to rest. The insects quickly disappeared, and the balance was restored. The problem to be solved is the reason of paucity of insects in certain seasons. Although birds are a powerful agency, their result is not so much seasonal as permanent. If the fluctuation of insects depended entirely upon the increase or decrease of birds, then the facts would be very obvious. Sometimes it happens that when birds are very numerous insects are so too. From personal observation I am inclined to think that the various meteorological changes are more potent. The numbers of insects in certain seasons can only be explained when the whole circumstances are known. As a rule these are complex. The study by many entomologists of certain species over a number of years, would probably help to ascertain the real causes of their abundance or otherwise.—HERBERT E. NORRIS; St. Ives, Hunts, February 11, 1884.

COLLECTING NEAR MANCHESTER.—I shall probably be staying at Manchester during the greater part of the summer, and as I wish, if possible, to try some sugaring during June and July, I shall feel much obliged if any of your correspondents can give me some information as to localities in the neighbourhood, and the best way of getting at them.—H. L. EARL; The Grammar School, Manchester.

TOURIST'S HANDBOOK OF EUROPEAN BUTTERFLIES. — We understand that arrangements have been concluded by Messrs. Macmillan & Co. with our correspondent Mr. W. de Vismes Kane to produce a new work, with illustrations, on the above subject. Further particulars will be announced, and the book will probably appear shortly. Such a handbook is much needed; and it will be to entomologists in the field what Dr. Lang's work on the European butterflies is in the library.—J. T. C.

ERRATUM.—In my description of *Pieris spilleri*, Entom. xvii., p. 62, line 32, for "costal and INNER margins are dusted with black" read "costal and HIND margins are dusted with black."—A. J. SPILLER.

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VARIATION OF EUROPEAN LEPIDOPTERA.*

BY W. F. DE VISMES KANE, M.A., M.R.I.A.

THE Author defined a species to be a group similar among themselves throughout their life-history and sexual development, with a common inherited characteristic difference in some stage of their development from all other groups of individuals. "Types," he said, "can thus be fixed on of sufficient permanence to render of great interest all records of their variation, since such records will in many cases eventually constitute the history of fresh species." It was such alterations of characteristics, giving birth to incipient species, that he intended to consider.

He then pointed out that there were apparently two controlling forces at work among living organisms,—namely, the law of persistence and the law of variation,—and that the naturalist was met at the threshold of his investigations by the problem of whether the variations ever exceed the limits of species so that one type merges by imperceptible gradations into another; and if this be answered in the affirmative, he has then to consider "whether generic distinction form inexorable limits to variation." There are certain groups of Lepidoptera which challenge retrospective enquiry into their past history, such as the Hesperiidæ, and especially the genus *Syrichthus*, of which there were about sixteen admitted European species, all so closely approximate that their synonymy is almost in a chaotic condition, *alveolus*

* Abstract of a paper read before a Meeting of the Yorkshire Naturalists' Union at Barnsley, March 4th, 1884.

being the single indigenous British species. Again, *cassiope* and *blandina* are the only British representatives of the large genus *Erebia*, butterflies of uniform and monotonous coloration also, whose species (often inconstant among themselves in marking) graduate one into the other by very slight distinctions. The under side of the hind wings of *ligea* has a wavy streak of white running from the costa to the central area of the wing, where it terminates in a whitish angle, which angle only is preserved in the centre of the hind wings of occasional specimens of *euryale*, while the costal portion is represented and retained in a modified form in *neoridas* and *medea*. A similar and parallel case was pointed out as existing in the genus *Cænonympha*, where an irregular pale band on the under side of the hind wings varies greatly in delineation from *davus*, of the Scotch type, to *philoxenus* (*rothliebii*), and is fragmentarily reproduced in the ordinary British type of *pamphilus*, which, however, in the South European form, var. *lyllus*, shows the band almost continuous from costa to inner margin, and exhibits well-marked though small marginal ocelli.

Another remarkable phenomenon was also referred to, namely, what the author called topographical characters, such as that remarkable configuration of wing observed by Mr. Wallace among the Pieridæ and Papilionidæ of the Isle of Celebes; thirteen out of fourteen of the latter, and ten of the former, having either the strange elbow in the costa or the extremely pointed and hooked apex, which is not to be found in any of the most approximate species existing in the neighbouring islands of the Malay Archipelago or elsewhere.

Another example was pointed out, namely, the white neururation of the under wings of no less than six species belonging to four genera of South Russian Rhopalocera. These similar peculiarities seem to suggest a similar derivation.

The remainder of the paper was directed to such variation as is at present progressing, and these were classed in two categories—those which were temporary though recurrent, or persistent and hereditary, namely, aberrations and varieties.

Cases of sexual dimorphism, such as *Argynnis paphia*, ab. female *valezina*, were referred to, where the sexual tendency to a more sombre colour than that of the male was developed excessively, producing this extreme form. The physiological

test of fertile union with type was given as being the distinction between varieties and aberrations.

The Author then dealt with the moot question of the influence of food in producing variation, and exhibited a specimen of *Melitæa artemis*, which had been one of a vast army which appeared first in the larval stage in a locality in the county Clare, Ireland, and covered some fields with myriads of starving caterpillars, of which this one survived, and with numbers of others emerged next season, a stunted and pallid insect, no larger than the Alpine var. *merope*, and almost as faintly coloured. The stint of food, either by accident or by the effect of climate stunting the food plant, affects the size of the insect in all stages.

Many of the higher Alpine *Erebix* exemplify this in their dwarfed proportions, while insects in arid tracts in South Europe, whose food product has been stunted by drought, exhibit the same diminution of size. But it was pointed out that diversity of food did not produce variation in colour so usually as is commonly thought. One or two instances, such as *Abraxas grossulariata*, in which immediate aberrations are procurable by change of diet, were admitted, but these the author considered exceptional, and even when the larvæ were altered greatly in colour the imagines appeared of the normal type.

An instance of *Cleora lichenaria*, bred by the Rev. Joseph Greene upon an orange-coloured lichen, having orange spots scattered over the wings, was thought to have been an effect of mimicry, by which some of the variable species of Geometers, which rest with wings outspread, assimilate their colouring to that of the wall or tree trunk on which they settle.

The effect of climate was stated to be diverse in the case of the diurnal and nocturnal sections of Lepidoptera, the Heterocera of subalpine and polar regions having well-defined patterns and generally deepened tones of colour, while the Rhopalocera become bleached in hue and blurred in definition. The light and heat of the sun was shown, by examples of Central and South European butterflies, to render colours more warm and brilliant, while white is often replaced by silver, and coloured spots—as in some of the *Lycænidæ*—shine with metallic lustre as we travel south.

The effect of the law of heredity was next touched upon, and its power of rendering the type permanent in the case of some species was shown to be most potent, some butterflies, such as

Vanessa antiopa, and among the Geometers *Deiopeia pulchella*, ranging over a vast extent of the globe, and preserving their characteristics almost unaltered in every climate. This law of heredity often, too, asserts itself when we see a common generic tendency to revert to some ancestral characteristic. Possibly the occasional coalescing of the spots on the under side of *Lycænidae*, and the tendency to supplant or vary the crimson of the *Zygænidae* with yellow, may be explained in this way.

The purple tints on the under side of the hind wings of some *Argynnidae*, which from the rich hues of *amathusia* grade down through *dia*, *ino* and *paphia*, and are unrepresented in its allied species *pandora*, are very variable in their depth of tone; and the remarkable variety of *paphia* taken by Mr. Barrett a few years ago, whose whole under side of hind wings was suffused with purple, was cited as a case of reversion to an ancestral type.

Cases of sexual dimorphism were then referred to, especially the blanched female aberrations which occur in the several species of *Colias*, i.e. *edusa*, *palæno*, *erate*, &c.

Reference was also made to the tailed female aberration of *Papilio memnon*, and the author denied that secondary sexual characters are more rarely found in the female than in the male, as is stated by Darwin to be the case in other fields of zoology.

After speaking of the success of Mr. Llewellyn in mating melanic specimens of *Tephrosia biundularia* and *crepuscularia*, and producing thereby a long series of like forms, thus actually almost producing a new species if it were kept long enough from intercourse with the ordinary type, he mentioned the extraordinary notch-winged aberration in our now domesticated *Liparis dispar*, which from time to time makes its appearance, and which might eventually become uniform and stable in its character, and recur chronically as a dimorphic variety.

Seasonal dimorphism was then illustrated by the striking and very different spring and summer broods of *Vanessa levana* and *prorsa*, which were formerly reckoned as different species, and a specimen of the third and intermediate form was shown, *abporima*, produced by forcing the insect in winter.

The var. *callunæ* of *Bombyx quercus* was instanced as in every probability having arisen from this seasonal dimorphism, in parts of the country where the early autumns obliged the

insect to change its normal habits. Hybrids the author defined to be irregular attempts to establish, "per saltum" and in a single generation, what natural law permits only to be effected step by step,—that is, the inauguration of a new species,—and the penalty for such imfraction is extinction, and accordingly hybrids are infertile.

The authority of Boisduval was quoted to show that among such closely related species as some of the *Zygænidæ*, which frequently are found to couple unnaturally, the ova is invariably infertile. Deformities, monstrosities, and hermaphroditism were then touched upon very cursorily, and the influence of locality and soils were dealt with, the conclusion being that the influences exacted are very small, but may give rise to tendencies, developed subsequently into characters by heredity. Localities isolated from the rest of the world by lofty mountains, deep forests, or the sea, were pointed out to be thus the most productive of eccentric forms. Isolation begets peculiarity, and in the remarkable series of Shetland insects taken by Mr. MacArthur we have interesting evidence of the fact.

The Author summed up as follows:—"Of the past history of species we can only reason from analogy, but on comparison of the forms grouped together in one genus the student of classification cannot but be struck with many common points of resemblance which suggest that they are often nearly related to one another, at least ancestrally. But such conclusions must necessarily be merely speculative. We have firmer ground to go upon, however, when we deal with the evolution of species at present in progress. We find that the order of Lepidoptera is subject to many kinds of variation, some attached to one sex only, others depending on the season of emergence; some which are constant and hereditary, and others which are capricious and irregular in their appearance. Some, too, there are which I have termed 'generic;' that is to say, that many species of the same genus show a common tendency to vary alike in some particular, and this tendency seems to point to their derivation from a common stock originally. Whatever the exciting causes may be of deviation from the typical pattern, whether climate, soil, quantity, or quality of food, we have seen that the law of heredity is of paramount influence in developing variation so produced, and in transmitting and stereotyping it, as is clearly shown by

the results of close breeding, as induced sometimes in nature by isolation, as in the case of an island or alpine valley; or artificially, as in the instance already cited of the aberrant melanic forms of *T. crepuscularia* and *biundularia*, which have become permanent varieties, if not species, I am given to understand, in a wood in the neighbourhood of Barnsley, where they replace the normal type.

“Of the remote and primary causes of variation we as yet know but little with certainty, except in the case of the presence or absence of sunlight and heat, which without doubt is most potent in the development or degeneration of colour and distinctness of pattern; acting, as we have seen, inversely in the case of the nocturnal and diurnal divisions of Lepidoptera.

“As to the effect of diversity of food, I have ventured to express my belief that, with certain exceptions, it is not directly apparent in individuals, though, in common with other causes, it may eventually leave its impress on a race. But that its abundance or scarcity acts powerfully on the size and vigour of the insect in every stage is undeniable.

“As to those strange topographical characters, two cases of which I have brought under your notice, which are possessed in common by a number of insects peculiar to a particular district, I do not venture a suggestion, unless that in some way the law of mimicry, that most inexplicable of all natural powers, has asserted itself.”

The paper was then brought to a close by an appeal for more systematic scientific work; that facts bearing upon the topics reviewed that evening might be collected and written down as they occur, and that in forming collections more attention should be paid to local aberrations, and phenomena relating to the life history of any insect, no matter how common and well known. The possession of long series of variable insects was strongly recommended, the locality and date of capture of each specimen being indicated by a number referring to the entomologist's memorandum book; and the author referred to Mr. Bond's magnificent collection as being one of the few English ones which had been formed on such principles, and possessed a scientific interest of great value to a student of the laws of Nature.

NOTES ON EXOTIC LEPIDOPTERA REARED IN 1883.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société Nationale d'Acclimatation de France.)

(Concluded from p. 33.)

LEAVING the American species, I now come to my—

Hybrid, *Roylei-Pernyi*. — In my report on the rearings of 1882, which appeared in the 'Journal of the Society of Arts,' 19th and 26th of January, and 2nd and 23rd of February, 1883, long details on the rearing and descriptions are given of this new silkworm, which I had obtained by the crossing of *Antheræa Roylei* and *A. Pernyi*. This year (1883) would have been the third year of its existence, but I much regret to say that it has disappeared entirely, degeneracy being the principal cause; the same degeneracy having also showed itself with the *A. Pernyi* bred at the same time. Details on this subject will be given in my next report.

Attacus cynthia (*Ailanthus* silkworm).—This year, having no *Ailanthus* trees at my disposal, as I had at my former residence in London, I reared the worms most successfully on laburnum trees; a few also fed on lilac and the common ash. I had a considerable number of cocoons, the moths from which emerged from the 2nd to the 30th of June. I obtained thirty pairings, and therefore several thousands of eggs and larvæ. These I placed on most trees in the garden, some when young feeding well on the climbing rose-trees against the house, but they all disappeared with the exception of those on the laburnums and the few placed on lilac and ash. The first cocoons were commenced on the 1st of August and the last on the 27th of September.

Actias selene.—Of this splendid Indian species I only had a few cocoons, which were from my own rearing in 1882, and a few also which had been sent to me from Scotland and Germany, all from the same stock of ova obtained by me in 1882. Some of these cocoons, which I had partly cut open to see how many sound pupæ I could rely upon, were attacked by dipterous parasites; so were cocoons of other species, cut open for the same purpose. I have therefore come to the conclusion that it is dangerous to the pupæ to thus open the door to their parasitic

enemies. This habit of opening the cocoon to see if the pupa is alive is frequently resorted to, but it ought to be discontinued in consequence of the fatal effects resulting therefrom. Three moths I mentioned as having emerged in January. From the 4th of June to the 14th of July thirteen moths emerged, four females and nine males. The last female moth, which emerged on the 4th of July, and the last male, which emerged on the 14th, having come singly, were of no use for reproduction. The three other females, having emerged in company of males, all paired, which was a complete success as far as the pairings were concerned. The first pairing took place between 12 and 3:30 on the morning of the 21st of June, all the ova hatching without any difficulty from the 6th of July. I did not keep any ova of the second pairing, which took place on the 28th of June; but those I kept of the third pairing (29th of June) did not hatch, at least one larva alone hatched. The third and last pairing was that of the two finest and largest specimens, and it lasted a considerable time. How is it that the larvæ did not hatch? The same unfortunate result took place with other species, especially with the two last pairings of *Antheræa mylitta*. I cannot tell the cause to a certainty, but my opinion is that it is due to unfavourable weather, just at the time when the larvæ are on the point of hatching; the larvæ, through want of sufficient heat, have not strength enough to cut the shell of the egg, and die and dry up inside the egg. Details on the rearing of this species will be given later on. The last *selene* larva, reared in the garden on a pear-tree, did not begin to spin before the 11th of October.

Actias atlas.—Of this species I had a large number of cocoons of the Ceylon race, from which I only obtained ten moths, at intervals, from the 11th of July to the 26th of September; several moths were crippled, and there was no chance of obtaining a single pairing. With twelve cocoons of the large Himalaya race I obtained four moths, two females and two males, one of the latter, the last moth obtained, being a cripple. Two specimens, one male and one female, were very perfect and with splendid colours, and both measured over ten inches in expanse. These four specimens emerged from the 28th of August to the 28th of September. One cocoon I found later on, with a male dead moth inside the pupa-case, a thing of frequent occurrence.

Antheræa mylitta (paphia). — Of this species I had four

different races: the Himalaya (sent by a correspondent in Calcutta); a few cocoons from Madras, which had hybernated twice and were in splendid condition; and cocoons from Ceylon and Bombay. Moths of these various races emerged from the 7th of June to the 13th of October, those of the Himalaya race alone emerging from the 17th of August to the 13th of October; and some may keep on emerging as long as the weather is mild. I have a magnificent series of moths of all shades of colours, from the bright golden yellow to the darkest brown and gray. My notes on this species cover nearly six pages of my book, and they could not here be reproduced, even if they were of sufficient interest. An experiment I made, in view of hastening the emergence of *mylitta* and *atlas* moths had the very opposite effect. I plunged the cocoons in sawdust, leaving only the upper ends outside: I even covered some of the cocoons with wadding during the winter and part of the spring. Now only a few moths emerged from these cocoons so protected, the remaining cocoons remaining still in perfect condition. On the contrary, the cocoons entirely exposed to a freer ventilation, produced moths almost without any interruption. So my plan for hastening the emergence of the moths turned out to be very bad, and I shall not of course repeat the experiment.

The number of moths I obtained was somewhat considerable, but the number of pairings recorded in my book is only six. The first took place on the 3rd of July; the second on the 6th; the third on the 9th; and the fourth on the 12th of July. Later on I had the fifth pairing on the 7th of August, and the sixth and last on the 18th of August. No larvæ hatched from the eggs of these last two pairings, although they were kept in a warm room. The first two pairings were of the Ceylon race; the third of the Bombay race; the fourth, a cross between a Bombay female and a Ceylon male; the fifth, a cross between Bombay male and Ceylon female; the sixth was of the Himalayan race. The rearing of the larvæ of the first four pairings was not successful, most of the larvæ dying when in the first or second stage; and I do not think oak, although they eat it, is a very suitable kind of foliage for this species. Only a few larvæ reached the third stage, and only five the fifth stage; three in the fifth stage soon died after moulting, leaving only two. I then discontinued the rearing, and sent these two remaining larvæ to

Mr. F. Moore, of the Bethnal Green Museum, who already had some in the first and second stages, together with *selene* in fourth and fifth stages. These larvæ were artistically drawn and painted by his son.

Before concluding, I shall say a few words respecting a most extraordinary specimen which I obtained from one out of the large stock of *Samia cecropia* cocoons I had this year. Whether the cocoon which produced this abnormal specimen differed from the *Cecropia* cocoons I could not tell; in fact, I never saw any difference in any after removing them from the cages, when empty. As to the locality it came from, it would equally be impossible for me to say, as I had a large number from various States: Wisconsin, Iowa, Illinois, New York, Delaware, and perhaps from other States.

A long and interesting description of this unique specimen has been written by Mr. W. F. Kirby, of the British Museum, which will be found in the 'Proceedings of the Entomological Society of London.' This specimen, if not a new species, I consider as being a most wonderful aberration of *Cecropia*, rather than the produce of a cross between *Cecropia* and some unknown species—but it will, in course of time, be known whether other such specimens have been found in America. This specimen, measuring $6\frac{3}{4}$ inches in expanse, is not only remarkable for the great difference in the markings and designs on the wings, as compared with *Cecropia*, but also for the exquisite beauty and variety of its colours, which are arranged or blended so harmoniously together that they form a striking picture which few, if any, specimens of the same family could surpass or even equal.

This specimen was exhibited by me on the 3rd of October, at the Meeting of the Entomological Society of London, together with a number of various silk-producing specimens of those species which I have bred for a number of years. Conspicuous among them were specimens of *A. mylitta* (the Indian *tussah*), in their various shades of colour; also two giant Himalaya *Atlas*, male and female, of unsurpassed beauty, each measuring over 10 inches, as stated before. Together with these silk-producers were specimens of the little Sphinx, *Hemaris tenuis*, or rather *diffinis*; the specimen of *Darapsa myron* and its pupa-case, and the two specimens of *Apatura clyton* (bred by me from the larva), with

their pretty white pupa-cases, the green colour having disappeared after the emergence of the butterfly, as is the case with other species. I also exhibited some of the remaining larvæ of *Telea polyphemus* and *Hyperchiria io*, reared in the open air.

Tudor Villa, Tudor Road, Norbiton, Surrey, October, 1883.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

EPUNDA LUTULENTA AND VARS. — My amusement consists in collecting specimens of our insular Noctuæ from different parts of Europe, and I think that I can assist Mr. Kane. The typical *Epunda lutulenta* of continental authors is a relatively light-coloured insect (*vide* the figures of H.-S., 83 and 405, and of Hübner, 159; and also specimens in my collection), which we seldom see. Their *luneburgensis* (*vide* H.-S., 429 and 430) is our *lutulenta* proper in its various shades of depth of colour, and I doubt whether any one of these is sufficiently dark to justify its being set up as a distinct variety, for I have seen Kent specimens as dark as those from Morayshire. *Sedi* is no doubt the ash-gray variety passing here as *luneburgensis* (but why?). I certainly have received *sedi* from Germany under the name of *luneburgensis*, but I have set that down as done in deference to our English acceptance of the word; and this is probably the case with Mr. Doubleday's specimen. Herrich-Schäffer gives a figure, No. 428, which is a fair representation of *sedi*, and probably intended as such; but unfortunately, in the text below, the number is quite omitted. I have observed in other instances that our typical form is classed abroad as a dark variety, with a consequent confusion of names—ex. gr., *Acronycta leporina*: the continental typical insect is of a dead white ground colour; their *bradyporina* is just such as our *leporina*. Writing in a general way, I may add that many of the continental forms are so many shades lighter in colour, as well as larger in size, that were they found in Britain they would rank as light varieties. This is merely a confirmation of the well-known tendency to melanism generally observed in northern insects—I mean Britain contrasted with Central Europe. —N. F. DOBREE; Beverley, East Yorks.

DASYCAMPA RUBIGINEA IN SOMERSET.—It was my good fortune to take an excellent specimen of this moth on the 24th of last

month, while it was feeding on the blossoms of a box tree in my garden.—(Rev.) J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton, April 19, 1884.

THE LEPIDOPTERA OF LONDON SUBURBS. — When I was a collector of Lepidoptera I had my attention frequently drawn to the circumstance noted by Mr. T. W. Hall, *viz.*, the numerous species that would occur within a small area in one of the "greeneries" that occur about the suburbs of the metropolis—greeneries, alas! which the builders have fearfully reduced in number since I quitted London ten years ago. It was a common occurrence that when going out after these insects into (say) Kent or Hertfordshire, to a distance of twenty or thirty miles from the metropolis, one returned home with boxes far lighter than one obtained as near London as Wimbledon or Ealing. Of course, when going to distant hunting-grounds, some species were taken which would not be found in the London district. My explanation is this—that owing to the destruction of woods and hedges, and the disappearance of fields about London, the yet remaining species of insects congregate in the few spots that afford food and shelter. And then, again, it is probable that the warmth of suburban London is rather liked by some species of Lepidoptera. If we are to credit (as I presume we may) the records left by the old aurelians, the vicinity of London used to be a first-rate collecting-ground. I fear that now many passably good insects I used to capture within a few miles of Charing Cross have vanished, and London collectors must travel to other localities for them; fortunately, the investigative abilities of our younger entomologists have discovered some capital spots which nobody visited or thought about when I first took net in hand. It would be vain (just to quote a few instances) to search about London suburbs in 1884 for *Argynnis selene*, *Vanessa cardui*, *Dicranura furcula* and *bifida*, *Notodonta dictæoides*, *Cucullia chamomillæ*, *Polia tincta*, *Trichiura crategi*, *Lasiocampa quercifolia*, or *Boarmia roboraria*; at least I hope anyone who takes them there will mention the fact, but not name the precise spot.—J. R. S. CLIFFORD; Gravesend, Kent, April 2, 1884.

RETARDED EMERGENCE. — We have seen several instances of retarded emergence in Lepidoptera lately recorded in these pages, and especially amongst the larger species of moths. Possibly the reason why the notices appear relating to the larger species more

often than among the Noctuæ and Geometræ is because the larger ones are more often looked after, and the pupæ kept over in the hope that some of them may emerge in time. This is so in my case, and specimens of *Saturnia carpin*i and *Dicranura vinula* are now emerging from larvæ fed in 1882. They are, however, malformed. There seems to me no sufficient explanation for such a retardation of Nature's natural course, unless it be in the fact that, being in the house, therefore in a dry site, they have lacked that moisture which they would have had in their natural habitats. This idea is further strengthened by the fact that, had the *D. vinula* been allowed to pupate on the trunk of a living tree, instead of on pieces of dry bark, they would have had a supply of moisture which they lacked in the loose pieces of bark. Some *Acronycta megacephala* which pupated in the same pieces of bark failed to emerge, which tends to show that moisture is necessary to their well-being. Some reason of course there must be, and although it is well known that *S. carpin*i often stands over for two or even four years, yet I have not noticed the same thing occur with *D. vinula*. It would be useful to know why such things occur; and if entomologists would publish their experiences of a like nature some definite conclusion might be arrived at, and lead to a knowledge of the laws which govern such retardation. — W. A. WRIGHT; Secretary's Department, Inland Revenue, Somerset House, March 25, 1884.

COLOUR PREFERENCES IN NOCTURNAL LEPIDOPTERA.—Mr. L. P. Gratacap, of New York, writing in the 'American Naturalist,' says:—"For two seasons past (1881 and 1882) I have made fruitless attempts to reach some definite conclusions as to the relative importance of a few primary colours as attracting signals to night-flying insects. I do not know whether the plan adopted is original or not, and as it may yield some useful or interesting results in the hands of others I briefly describe it:—I made four or five sleeves, or cylinders open at both ends, of variously-coloured tissue papers, and drew them over common kerosene lamps with glass chimneys,—the familiar illuminating agent of all country homes,—thus improvising a very serviceable and inexpensive Chinese lantern. The advantage of this arrangement consists in the ease with which the coloured sleeves can be changed, any combination of colours being secured without removing the lights, and so a uniformity of light-power main-

tained at the several stations and for the several colours during one experiment. The method also permits a very easy adjustment of lights in their intensity, by raising or lowering the wicks, and thus allows the observer to test strength of mere illumination against attractiveness of colour as a hue for the insects. The planting of the lights seems important. I started by placing them in a row at long distances from each other. The defect of this arrangement appeared to be that the brilliancy of the first light, encountered by the insects coming upon it from its side or portion of the row, interfered with the visitor's freedom of choice as between that colour and another when the light from the others reached it in a dim and imperfect manner. The lanterns were then arranged in a square (four colours), whose dimensions were determined by the intensity of the several lights. The distance between the lanterns was such as to allow the limital circle of illumination of each at first to touch, and subsequently to intersect those of its neighbours. This distance was reduced until [the separation between the lanterns was less than the radius of the circles of light which each threw around itself, the lights being of equal intensity. This proved unsatisfactory, and having devised no means of exhibiting a number of coloured lights so that the chances were equalised completely for insects coming from all sides, to choose according to any constitutional preference for one colour over another, I used only two colours at a time. The arrangement might be found useful to place four lanterns in two pairs, each pair of one colour, and in a diamond pattern, so that each colour appears equally prominent, no matter from what side the dazzled insect may approach the group. The apparent necessity for allowing the insect to choose instantly between the colours before it reaches either arises from the infatuation produced in the insects by the light, which once reached seems to obliterate all capability in the creature to free itself from its enticement, except in an irregular and accidental manner. My experiments proved nothing except the absence of any marked preference for certain colours over others, and the almost invariably greater charm exerted by the white lantern, which, on account of their translucency, appeared more brilliant than the coloured lamps."

EFFECT OF ARTIFICIAL HEAT UPON HYBERNATING LEPIDOPTERA.— On the 14th of January I was attending a village

concert not far from here, the room being crammed to suffocation, with no top ventilation. After enduring this state of things for about an hour I was agreeably surprised at the sight of a somewhat half-awake specimen of *Hydræcia micacea*, fluttering about the room not far from where I was sitting. After careering about for a few seconds it disappeared under the platform, and therefore vanished from my sight. To-day (January 16th) I saw and captured a good specimen of *Vanessa atalanta*, which I released soon afterwards, having already a large collection of bred specimens of that beautiful insect.—H. ARCHER; The Close, Ely.

PETASIA NUBECULOSA THREE YEARS IN PUPA. — On looking into my breeding-cages on March 4th I was much pleased to find a very fine female *Petasia nubeculosa*. It is from one of the eggs I received from Rannoch in May, 1881, and it has remained in pupa from June, 1881, until this present date, March 4th, 1884. One of the brood came out in March, 1882, two in April, 1883, and now one in March, 1884.—W. H. TUGWELL; Greenwich.

HYBERNIA PROGEMMARIA, var. FUSCATA.—During the month of March last I had the pleasure of taking and breeding some very fine and varied forms of *Hybernia progemmaria*. The fore wings are of one uniform dark brown colour, the three transverse lines show out very distinctly, being of a darker colour still, as do also the row of dots on the hind margin; whilst in some there is a row of light-coloured dots between the third line and hind margin. I have also some very good banded types. Of the var. *fuscata* the colour of the fore wings is one uniform dark soot- or smoke-colour, with hind wings a shade lighter, and the body black; the usual transverse lines and dots are altogether invisible, with the exception of the one across the hind wing. I should like to hear if the same forms are taken in any other locality.—J. HARRISON; 7, Victoria Bridge, Barnsley.

CAMPTOGRAMMA FLUVIATA AT BOURNEMOUTH.—On the evening of September 2nd, 1883, during a violent gale, accompanied by heavy downpours of rain, I boxed an excellent specimen of *Camptogramma fluviana* off some railings immediately beneath a gas-lamp in the Pleasure Gardens, Bournemouth.—WM. E. BRADY; 1, Queen Street, Barnsley.

DESCRIPTION OF THE LARVA OF GYMNANCYCLA CANELLA.—For the opportunity of studying this interesting species I have on two

occasions been indebted to the Rev. E. N. Bloomfield, M.A., of Guestling Rectory, near Hastings. In December, 1881, he kindly sent me several pupæ, from which I bred imagos the following year; and on September 13th, 1882, I further received from him a supply of larvæ which he had collected from *Salsola kali* growing on "blowing sand by the sea-shore at Camber, near Rye, East Sussex." They were of various stages of growth, those apparently full-grown being about three-quarters of an inch long, rather attenuated when crawling, but of fair proportions when at rest. The head has the lobes rounded, is slightly narrower than the 2nd, and still narrower than the 3rd, segment; body cylindrical, and of almost uniform width, tapering only a little at the posterior extremity; skin smooth, but not at all glossy, except on the anal segment, whereas the head and frontal plate are highly polished; segmental divisions well defined; there is also a slight transverse depression on each segment, and a puckered ridge along the spiracular region. The ground colour of the dorsal area varies from pale pea-green to dark green; head gray, more or less marked with intense black, some of the darker larvæ indeed having the cheeks and part of the face perfectly black. Dorsal stripe clearly defined, either of a darker shade of the ground colour, of whatever shade of green, or in some specimens purplish brown; subdorsal lines only faintly discernible, grayish; there are no perceptible spiracular lines; usual dots very minute, black, except those on the 3rd and 12th segments, which are larger, and white, encircled with black; spiracles also very minute, brown. Ventral surface uniformly of a paler shade of the ground colour. Another variety, which is evidently much less common than the preceding, has the ground colour dark olive, the dorsal line purple, and between it and the gray subdorsal lines another faint line of a paler purple; whilst along the spiracular region is a broad irregular stripe, brownish yellow in the centre, but edged above and below with gray; this stripe is really composed of a series of blunt wedge-shaped marks laid longitudinally, and the base of each mark adjoining the apex of the one following it. This variety, too, has the head black, and the mandibles dark sienna-brown. Ventral surface dingy olive-green. The larva spins small silken webs about the tops of its food-plant, *Salsola kali*; and when full fed descends below the surface of the sand, and forms a small oval cocoon composed of

grains of sand completely woven together with silk. The pupa is of very ordinary shape, about two-fifths of an inch long, evenly rounded, broadest at the thorax, and tapering gradually to the anal point. The whole surface is semi-translucent and polished, and all the parts are well defined. The eye-, leg-, and wing-cases are bright green, the thorax and abdominal segments yellow, the abdominal divisions brown, and a distinct green line, which shows through the translucent covering, extends through the dorsal area. The imagos emerged at the end of July and beginning of August. —GEO. T. PORRITT; Huddersfield, April 3, 1884.

NOTES ON CERTAIN TINEÆ.—Of the so-called species, *Gelechia ligulella*, *G. vorticella*, *G. tæniolella*, and *G. sircomella*, I feel sure that three, viz., *Gelechia ligulella*, *G. tæniolella*, and *G. sircomella*, are only forms of one. I took a large quantity of them this year; and they were swept from the *Lotus corniculatus*, different sexes in the different forms being freely paired. This is, I think, a convincing proof of their unity of species. *Gelechia vorticella* is so like the others that I should place it also as a form of the same species. If anyone takes *G. vorticella* freely, and would kindly allow me to inspect a series, I should thank him much and return them uninjured. I took a single specimen of *Retinia duplana* flying amongst fir-trees this year; it is a very distinct species, and has only hitherto, I believe, been before taken in Scotland in very small numbers. *Depressaria hypericella* has been bred this year from shoots of *Hypericum* by both Mr. Shuttleworth and Mr. Murray; it had not previously been noticed in the district. Some time ago Mr. Lacy took a specimen of *Æcophora minutella*, and this year I was fortunate in doing the same; it was flying, near dusk, across a road near farm-buildings. In August I first found larvæ of *Asychna terminella* mining in the leaves of *Circæa lutetiana*, in dark places in the woods. In September, last year, I found and recognised mines of *Nepticula punctella* in sloe. I had before seen this larva, but had stupidly mistaken it for *N. plagicolella*. I now see that the latter is yellow, and makes a clear whitish blotch, preceded by a slender gallery; the former is green, and its mine is coiled like a watch-spring, afterwards extending round the edge of the leaf. The “frass” fills up the gallery, and makes it light brown. The imagos emerged very freely in June. About August I found mines, which appeared strange to me, in wild strawberry; these produced in June following

N. arcuosella. Other mines in the same plant produced *N. aurella*—at least I cannot separate them from that insect. Amongst alder-bushes in a swamp, in August, I happened to find reddish larvæ in reddish mines, which were suspected to be *N. alnetella*; in the latter part of June these emerged as *N. glutinosæ*. Last year, when breeding *Nepticula betulicolella*, I thought that another species was emerging with them from similar larvæ; but on a more extended trial this year I found that the two sexes differ considerably, and thus my doubts were solved. *N. betulicola* males are rather smaller and browner; frequently the fascia does not extend quite to the costa, and the head is fuscous, with white eye-caps. *N. betulicola* females are purplish from the base to the fascia, which extends quite to the costa, and the head is yellow. This insect varies in intensity of colour with the temperature and climatic conditions of the season. Some years ago, in a hot summer, I bred some as brilliant almost as *N. alnetella*. I had last autumn collected considerable quantities of yellow larvæ blotching thorn, in order to find out the larva of *N. ignobilella*, which I am unable to separate from that of *N. gratiosella*. The result was that I bred in May plenty of *N. gratiosella*, no *N. ignobilella*, and one *N. regiella* (in the room). As I had larvæ from Witherslack and Preston (*viz.*, from limestone and sandstone), I am unable to determine the district from which it came, but hope to do so this year. I have previously bred *N. ignobilella* from one of the localities, and it is very curious that none turned up this year. The *Nepticulæ* that frequent thorn on limestone appear to be *N. pygmælla*, *N. oxyacanthella*, and *N. atricollis*; those on sandstone, *N. pygmælla*, *N. oxyacanthella*, *N. gratiosella*, and *N. ignobilella*.—J. H. THRELFALL; Preston, Lancashire, 1884.

LARVÆ OF BRITISH MACRO-LEPIDOPTERA. — For more than twenty years our lamented brother entomologist, William Buckler, worked assiduously at portraying the British larvæ; many of his figures I have had the pleasure of seeing, but strangers who did not know him, when I say he was by profession a portrait-painter, will be able to understand how it is that his drawings are so very life-like; they place every drawing of larvæ that I have seen attempted completely in the shade, when compared with his beautiful productions. These have, since his death, been purchased by the Ray Society; they consist of about 4500 figures,

and there are also four volumes of original MS. notes. The Rev. J. Hellins, who has also about 1800 of his drawings and sketches (some are only portions, such as a segment or a particular part that was necessary to enlarge for better description), has, in accordance with the understanding which existed between him and Mr. Buckler, and with a view of making the work, which is proposed to be published, thoroughly complete, placed the whole of them at the disposal of the Society; and from the whole amount of these drawings, some of which are in duplicate, no doubt the choicest will be selected for publication. The volumes that have already been issued by the Society are of first class description; this, I think, is a sufficient guarantee that the forthcoming work will be the best of the sort ever offered to the entomological world; it is expected to be completed in four yearly volumes. I must, however, remind your readers that they will not be able to purchase the work through their booksellers; in order to obtain it, it will be necessary to join the Ray Society, which can be done by communicating with the Secretary, the Rev. T. Wiltshire, 25, Granville Park, Lewisham, S.E. The annual contribution is a guinea; P.O.O. or cheque for that amount should be sent with full name and address; and while the annual subscription is continued every subscriber will get the full benefit of the works published by the Society *for the year*. Only a limited number will be published, and those who do not subscribe for the year of publication will stand a very great chance of being disappointed should they join afterwards for the purpose of obtaining this invaluable work. My advice to all who may read this and wish to avail themselves of this prize, and there is not the slightest doubt it will be a prize for any entomologist in the next generation, is to join the Ray Society without delay, and continue an annual subscriber to this very useful Society; and I am quite sure they will never have cause to regret it. In the works already issued no pains or expense have been spared to make them perfect; only first class artists and printers are employed, and to possess a volume issued by this Society is "to possess a thing of beauty which is a joy for ever." — G. C. BIGNELL; Stonehouse, Plymouth, April 14, 1884.

STUDY OF BRITISH DIPTERA. — I am about to begin the study of the Diptera, and should be much obliged if any of the

readers of the 'Entomologist' could tell me what books would be useful, or would give any assistance in naming the insects.—Address: Miss PRESCOTT DECIE, Bockleton Court, Tenbury.

[See Entom, xvi. 24.—E. A. F.]

REVIEWS.

List of Yorkshire Lepidoptera. By GEORGE T. PORRITT, F.L.S. Leeds. 1883.

THIS work is vol. 2 of the Entomological Transactions of the Yorkshire Naturalists' Union; and Mr. Porritt is to be congratulated upon the very successful manner in which the lepidopterous fauna of Yorkshire has been recorded. The work may be safely taken as a model for future local lists, its arrangement and general production being so excellent. The information as regards localities for each species, although most copious, is evidently carefully chosen, in every instance bearing the initials of the authority for the record. The type used is such that no confusion can occur, and the particulars sought can be seen at a glance.

It appears from Mr. Porritt's labours that there have been observed 1341 species of Lepidoptera out of a possible 2032 in the county; but we do not quite agree with the author when he says in his introduction that "I have no hope that many more additions will be made to the number of species of Macrolepidoptera." So comparatively little has been done in the more mountainous portions of North Yorkshire that it is highly probable there are other prizes in store for the collectors who work those districts. The following table will be found interesting, as showing how the groups are divided:—

| | Yorkshire. | British. | | Yorkshire. | British. |
|-----------------|------------|-----------|---------------|------------|----------|
| Diurni . . . | 48 | out of 64 | Aventiæ . . | 1 | out of 1 |
| Nocturni . . . | 80 | " 112 | Pyalides . . | 47 | " 75 |
| Geometræ . . | 207 | " 278 | Crambites . . | 39 | " 80 |
| Drepanulæ . . | 3 | " 6 | Tortrices . . | 203 | " 334 |
| Pseudo-Bombyces | 19 | " 27 | Tineina . . | 443 | " 700 |
| Noctuæ . . . | 224 | " 309 | Pterophorina | 18 | " 31 |
| Deltoides . . . | 8 | " 14 | Alucitina . . | 1 | " 1 |

This list ought to prove a great incentive to the entomologists of the Union to try to make additions, which must be still possible, especially among the Micro-lepidoptera.

If all the work of the Yorkshire Naturalists' Union is as satisfactorily tabulated as Mr. Porritt's portion, recently issued, it can no longer be said that local societies produce no results.

Transactions of the Huddersfield Naturalists' Society. Part 1.

THIS little pamphlet contains the Annual Report for 1883, and a Catalogue of the Lepidoptera of the Huddersfield District; the Macro-lepidoptera by Mr. S. L. Mosley, and the Micro-lepidoptera by Mr. Porritt. All this is of course incorporated in the York County List above referred to, so needs no further notice. By the Report we find there are 109 members; but, if we are to judge by the library-circulation, not half are too actively engaged in any branch of Natural History; for there appear to have been but 31 readers, who had out 190 volumes. The botanists appear to have been the most active section, but are closely followed by the entomologists as exhibitors at the meetings.

Seventh Annual Report of the Lancashire and Cheshire Entomological Society.

THIS is the Report for the past year,—1883,—and contains also the President's Address to the Society. In the latter it is suggested that the Club should follow the example of the Yorkshire Union of Societies, and publish a similar list of the Lepidoptera of the Liverpool district. As the Society bears the name of two counties, it seems to us most desirable that the work should be extended to Lancashire and Cheshire. If some competent person could be found to edit such a compilation, it would be most useful to present and future lepidopterists. Assistance would be most willingly given by those who at present collect in those counties, as well as by many who have in past times explored their insect fauna. Cannot the President undertake the work, if it has not already been commenced?

J. T. C.

OBITUARY.

SIR SIDNEY SMITH SAUNDERS, Knt., C.M.G., died at his residence, Gatestone, Central Hill, Upper Norwood, S.E., on the 15th April, aged seventy-four. It is with great regret we make this announcement; only at the April meeting of the Entomological

Society of London, Sir Sidney was present, and read a somewhat lengthy paper (his second this year) on the *Pediculus melittæ* of Kirby, which insect was described in 1802, and "whose natural affinities still remain debatable ground," in the hopes that a *résumé* of what is already known about this curious creature might induce "some of our younger members to direct their attention to the habits of this remarkable group." The proof-sheets of this characteristic paper were corrected and some additions made thereto the day previous to his death—characteristic, because probably nobody possessed the faculty of telling others what to look for and how to do it more clearly than he; his success in this direction was great—various parasites, locust-egg parasites, the anomalous fig-insects, and almost any aculeate Hymenoptera were forthcoming from intelligent correspondents in almost all parts of the world, where their presence surprised nobody more than the educated observers themselves. The recurrence of a severe attack of bronchitis, not improbably brought on by the late stay at the Entomological Society's meeting, was the immediate cause of death. Sir Sidney Saunders was the son of William Saunders, Esq., of Wandsworth, where he was born in 1810; he entered the Consular Department of the Foreign Office in 1826, and was appointed Consul to Albania in 1835, was transferred to Alexandria in 1859, and was Consul-General in the Ionian Islands from 1864 to 1870. His entomological studies were necessarily somewhat guided by his place of residence, in consequence of his diplomatic appointments, and many new facts and unrecorded habits were speedily discovered. He received the companionship of the Order of St. Michael and St. George in 1860, and was knighted in 1873. Sir S. S. Saunders faithfully carried out in the Hymenoptera those large views which he enunciated in the first paragraph, headed "Habits and instincts," in his Entomological Society's Presidential Address for the year 1875, in no way "limiting his investigations to mere distinguishing characteristics." He had a large knowledge of the Hymenoptera generally, especially of the *Aculeata* and their wonderful and diversified life-histories. His contributions also on the many messmates and parasites attending various species exhibit most minute researches and observations. He was especially interested in the habits of the South European briar insects and their parasites, of the coleopterous *Meloidæ* and

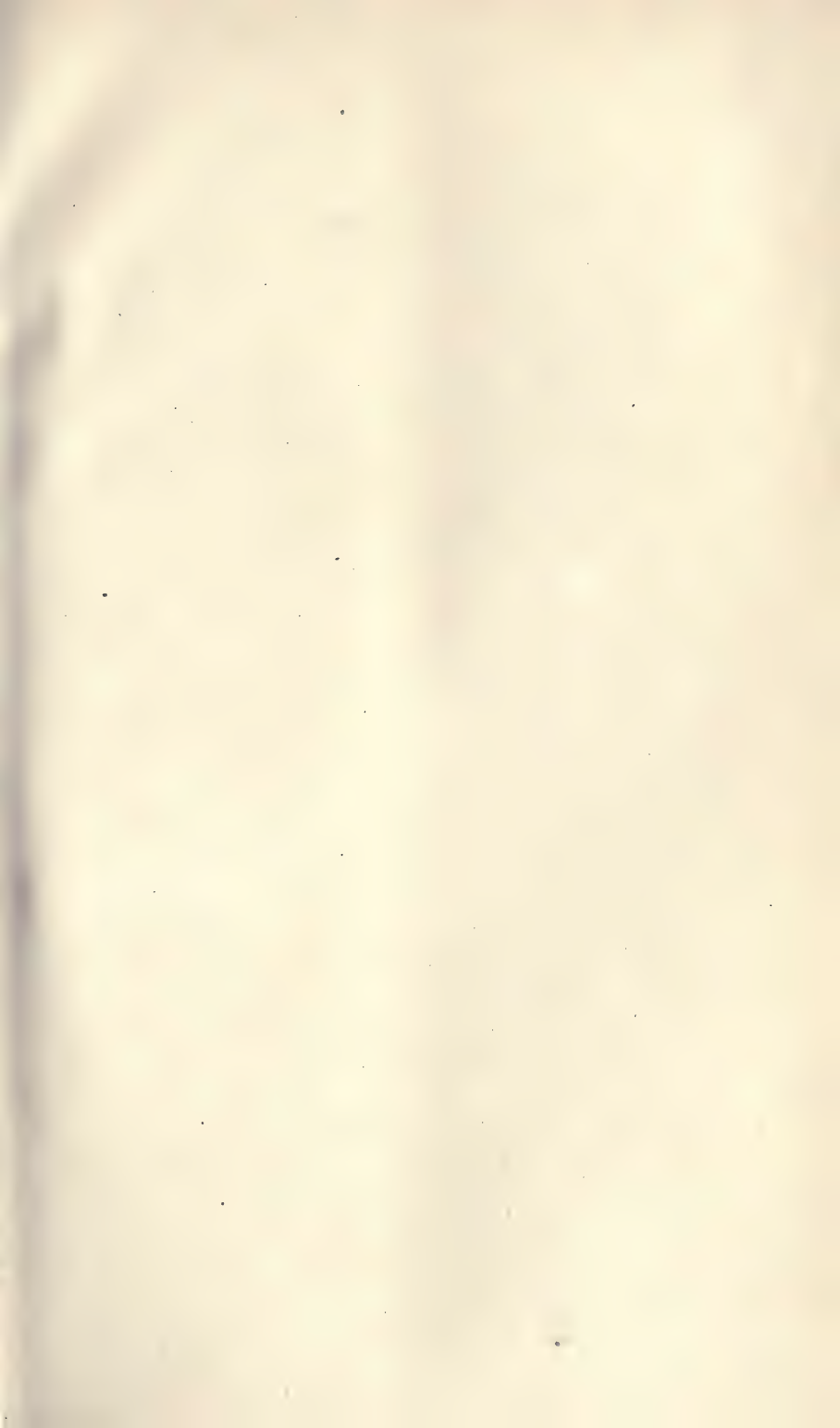
Stylopidae, of the dipterous *Conopidae* and *Bombyliidae*, of the interesting parasitic hymenopterous genus *Scleroderma*, of many of the parasitic *Chalcididae*, and especially in the history and affinities of the wonderful fig-insects to which he and Prof. Westwood have lately given so much careful attention. Sir Sidney was an original member (1833), a past President (1874-5), a present Vice-President, and always a strong supporter of and constant attendant (as far as circumstances would permit) at the meetings of the Entomological Society. His published papers—far too few to in any way represent his extensive knowledge—were mostly contributed to their Transactions; his first paper being read on May 4th, 1835, "Account of the attacks of various insects upon wine-corks," and his last on April 2nd, 1884, "On the *Pediculus Melittæ* of Kirby and its affinities, with reference to the larvæ of *Meloë*"—a long period embracing a time of great entomological progress, to which the subject of our notice was constantly contributing and carefully watching. He was often a fellow-worker with his friend Westwood, the only two original members of the Entomological Society who have continued to attend the meetings—the last representatives of an entomologically eventful era. His genial and sympathetic presence will be greatly missed by many of the younger members whom he so greatly loved to encourage. The death of this veteran Entomologist, who was a member of the French (since 1835), Belgian, Vienna, Italian, and other Societies, and whose enthusiasm and activity seemed to increase with his years, will be deeply regretted by many Entomologists both in Britain and abroad. His foreign correspondence was large, and he was a worthy representative of British Entomologists. The gracious manner in which his knowledge was brought into conflict with those of others is well exemplified in his recent controversies with M. Edmond André and Dr. Paul Mayer. He was always a most careful and scrupulously painstaking writer, corrections and additions being frequent to matter intended for publication or otherwise. This has been said to be a sure mark of genius, and with our lamented author it assuredly was so.—E. A. F.

WILLIAM PREST, of Holgate-road, York, died April 7th, 1884, aged fifty-nine years. Mr. Prest has been so long before the entomological public as a contributor to this Magazine, and one who had an exceptionally large circle of correspondents, that

his death will be felt as a personal loss to most of our readers. His taste for Lepidoptera, which branch of Entomology received his chief attention, was fully developed in the spring of 1857, since which he has been an assiduous observer and collector of both Macro- and Micro-Lepidoptera. Besides moths and butterflies, his attention was given, though not so completely, to other orders, including bees, beetles, and the Trichoptera of the York district. To his example may be traced the beginnings of several well-known entomologists of the North of England, and through him was established the present York and District Field Naturalists Society, of which he was the delegate to the Yorkshire Naturalists' Union. Mr. Prest at all times had no greater pleasure than showing his collection to those who could appreciate it, and his house was for a long period thrown open as a monthly meeting place for those interested in Natural History. These meetings were held, with the exception of a few intervals from time to time, from about 1859 up to a recent period. Our late correspondent contributed notes frequently to the various periodicals devoted to Natural History, his name first appearing in the 'Entomologist's Weekly Intelligencer,' as long ago as 1857. He added several Lepidoptera to the Yorkshire list, and one of his chief captures was a specimen of *Eubolia maniata*. Mr. Prest suffered from chronic gout, which gave him much suffering for many years, and eventually caused his death.—J. T. C.

ERRATUM.—Vol. xvii., No. 251, page 92, 3rd line from top of page, for "Bournemouth," read "Barmouth."—H. H. CORBETT; Ravenoak, Cheadle Hulme, Stockport.

ERRATUM.—In my communication to the 'Entomologist' for the present year, page 51, line 34, I have omitted the name "*Fasciata*, Brit. Cat., p. 92," after the word "remark"; the sentence should run thus: "with the remark *Fasciata*, Brit. Cat., p. 92 (an spec. diversa?)" Mr. R. C. R. Jordan, who has kindly drawn my attention to the omission, informs me that *E. discoidalis* and *E. fasciata* are very distinct, and that he has sent figures of both to Dr. Staudinger; so that in his next Catalogue he will probably place them apart.—J. JENNER WEIR; Chirbury, Copers Cope Road, Beckenham.





COCOONS & OF OPHIONIDÆ.

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THE ENTOMOLOGIST.

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[No. 253.]

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By JOHN B. BRIDGMAN AND EDWARD A. FITCH.

(WITH PLATE.)

No. IV.—AGRIOTYPIDÆ.

THIS family comprises but one genus, which contains but one species, of which Curtis wrote in 1832:—"This curious insect is considerably like *Helorus* and some of the Proctotrupidæ at first sight, and not unlike some of the Formicidæ; and the habit as well as the sculpture of the thorax remind us, at a casual glance, of the genus *Chlorion*; on examining the mouth, however, and wings, it will be found to be entirely different. It is undoubtedly one of the Ichneumonidæ, and bears considerable resemblance to *Hemiteles*; but it has no areolet in the superior wings" (Brit. Ent. 389). In a footnote he adds Latreille's opinion:—"In a word, it seems to unite the Ichneumonidæ with the Oxyuri." This aberrant species, which cannot be confounded with any other Ichneumon, is probably most nearly related to the Cryptidæ; it reminds one greatly of the aculeate *Agenia bifasciatus* or *A. variegatus*; Dr. Jordan likened it to *Pompilus plumbeus*, another Fossor (Ent. Mo. Mag. i. 186).

AGRIOTYPUS, Walk.

Black; wings of male obscurely clouded with pale brown; of female, yellowish, with four broad rich brown fasciæ. 1. *armatus*, 3—4 lines.

This remarkable species is rare. It was first taken by Mr. Henry Walker on the banks of the Clyde, at New Lanark, the males skimming over the surface of the water in the sunshine, and alighting on stones; later he found the females reposing on the

same stones, "apparently in a dormant state" (Brit. Ent. 389). In the same locality he observed, in June, "the female descend the sides of rocks to a considerable depth under the surface of the water, remain immersed for ten minutes, and then reappear without any apparent injury; this singular operation it repeated several times" (Ent. Mag. iii. 412). Francis Walker then (1835) conjectured "Can the object of these subaqueous wanderings be for the purpose of depositing its eggs in the aquatic larva of some neuropterous insect?" Twenty years later Vincent Kollar, Dr. Kriechbaumer, and Prof. v. Siebold bred this species from the larva-cases of the trichopterous *Silo pallipes*, Fabr. (*Trichostoma picicorne*, Pict.), in Bavaria and Bohemia. For interesting notes on its peculiar economy see Verh. z.-b. Gesell. Wien, vii. 189, 190 (1857); Stett. Ent. Zeit. xxii. 59-61 (1861); and Dr. Hagen's note in E. W. I. x. 148. Prof. Westwood exhibited larva-cases of *S. pallipes*, from Mentone, at the meeting of the Entomological Society of London, October 5th, 1863, from which specimens of this species had been extracted. He says:—"The cases had a long tail or appendage, which looked like a piece of grass or straw attached to the end." It has been suggested that this long foot-stalk, which Siebold so fully describes, is to enable the pupa of the Ichneumon to raise the case to the surface, it wanting the natatory powers of the phryganideous pupa (Ent. Ann., 1862, p. 23). Curtis tells us this species varies much in size, some species being only half as large as others; hence it is not improbable that the larger parasites of *Odontocerum* (*Molanna*) *albicorne*, Scop., were the same insect. It is beautifully figured in Curtis's plate; and Westwood gives its profile in outline (Introd. ii. 75, 14).

No. V.—OPHIONIDÆ.

This is an easily-recognised family, containing those Ichneumons which have their abdomens compressed and mostly petiolate; the areolet is small and mostly triangular, or wanting. It contains a numerous and varied collection of species, but the family characters are generally well marked.

Gravenhorst (Ichn. Europ., vol. iii.; 1829) included the genera *Campoplex*, *Paniscus*, *Anomalon*, *Ophion*, *Macrus*, *Trachy-*

notus, *Pachymerus*, *Cremastus*, *Porizon*, and *Atractodes*, in this family. Of these *Campoplex* has been subdivided into the genera *Campoplex*, *Charops*, *Cymodusa*, *Sagaritis*, *Casinaria*, *Limneria*, *Meloboris*, *Pyraemon*, *Canidia*, *Nemeritis*, and *Angitia*, by Holmgren in his 'Monographia Ophionidum Sueciæ' (Sv. Ak. Handl. ii. (8), pp. 1-158). *Anomalon* was subdivided into the genera *Schizoloma*, *Heteropelma*, *Exochilum*, *Anomalon*, and *Trichomma*, by Wesmael in his "Revue des Anomalous de Belgique" (Bull. Ac. Brux. xvi. (2), pp. 115-139). *Macrus* contains the males of *Coleocentrus*, belonging to the Pimplidæ. *Pachymerus* includes Schiödte's *Collyria* and Curtis's *Pristomerus*. *Exetastes*, *Arotes*, and *Banchus* were separated as a distinct family (Banchidæ) by Gravenhorst. *Mesochorus* was placed by him in the Cryptidæ, and *Scolobates* in the Tryphonidæ. *Neurateles*, Ratz., is omitted; Marshall included it in his catalogues on the authority of Haliday, who told him he had discovered it in Britain. We do not know that anybody has described the genus since Ratzeburg, who curiously in his 'Die Ichneumoniden' has mentioned no *Orthocentrus*; following his description, and taking this latter fact into consideration, we believe that *Neurateles papyracea* is only an *Orthocentrus*, and the description is not complete enough to identify it. Förster has defined it as a genus of his family Orthocentroidæ, slightly altering the name; but Förster's changes are so great and require so much confirmation that we cannot generally adopt them. Holmgren's 'Monographia,' the best handbook to this family, includes thirty-three named divisions in its Conspectus Generum: of these all but *Angitia*, Holmgr., and *Seleucus*, Holmgr., occur in Britain; and to the other thirty-one genera are added *Henicospilus*, Steph., *Agrypon*, Först. (very doubtfully, and only because included by Marshall), *Collyria*, Schiödte, and *Arotes*, Gr., besides Förster's divisions of *Plectiscus*. Wesmael's subgenera of *Anomalon* are only included as subgenera by Taschenberg; and Vollenhoven says "in our opinion Wesmael's subgenera . . . have no claim to be retained as genera;" the same with Holmgren's subgenera of *Paniscus*.

With but very few exceptions the Ophionidæ are parasitic on Lepidoptera, and most of them are remarkable for the cocoons which their larvæ spin after leaving their host. These vary much, those of many species being distinctly banded, and are

often very beautiful. Most of the types are represented on Plate II.; but the more detailed notes on their life-history can be better referred to under the respective genera. The *Anomalons* spin no cocoon, the Ichneumon emerging from the pupa of its host. The species of *Mesochorus* are all hyperparasitic, mostly on other Ophionidæ, especially on species of *Limneria*; also on various Braconidæ. As a familiar example the life-history of *Paniscus virgatus*, as worked out by Newport, may be taken:—The parent Ichneumon deposits her black, shining, pedunculate eggs on the caterpillar, when this is nearly full grown and ready to pupate. The fated larva, exhausted by the parasites, has but sufficient strength to complete and tapestry its cocoon or earthen chamber, as the case may be, before it dies, leaving its newly-formed abode to the occupation of its enemies, which grow rapidly, casting their skins three times; but as the body of the larva is still connected with the egg-shell they are not entirely got rid of until the larva is mature and becomes detached, before forming its own black cylindrical leather-like cocoon. The larva is mature on the fifteenth day: it is more than half an inch long, of a curved form, being smallest at each extremity, and with lateral fleshy tubercles (Linn. Trans. xxi. 71–77, pl. viii., figs. 13–19). See also Westwood's 'Introduction' (ii. 145–7, figs. 76, 7–15). Newport thus traced *P. virgatus* from the bursting of its egg to its assumption of the imago state, and having watched its growth and the formation of its tissues expresses the opinion that "in the earlier stages of growth they more resemble cotyledonous vegetables in general appearance than animal organisms, which are destined to become some of the most perfect and most active of their class" (*l. c.*, p. 71). They live by the direct abstraction of fluid from another living body into its own; and he regards these larvæ as the representatives among insects of the prematurely liberated fœtus of the kangaroo. The similar economy of the common *Paniscus cephalotes*, externally parasitic on *Dicranura vinula* larva, is known to most lepidopterists (Entom. xv. 163, and *cf.* Entom. xvi. 69); also the successful remedy of removing the shining black Ichneumon eggs from the anterior segments of the stung larva by means of forceps or with a fine needle, as recommended by Erichson and Treitschke. Apparently these eggs have recently been taken for pupa-cases (Ent. Mo. Mag. xx. 227) and for small beetles! (Entom. xi. 251).

It is hoped that the figures on the accompanying plate will lead to their better identification. Plate ii., fig. 19, represents the egg; fig. 16, a larva of *D. vinula*, with the eggs *in situ* on the third and fourth segments, the attenuated foot-stalk being inserted into the larva-skin; fig. 18 shows the parasitic larva feeding externally; fig. 17 represents the full-grown *Paniscus* larva, also the head enlarged; fig. 20 shows the cylindrical black *Paniscus* cocoons inside the *Dicranura* cocoons,—these are frequently spun so closely together that their sides become angulated, like the cells in a wasp's nest; these are mostly four to six in number; fig. 20 shows other cocoons of a lighter colour and more silky texture,—they vary much in both these respects. The cocoon of *Limneria rufa*, referred to by Mr. Bignell at Entom. xvi. 69, is figured on plate ii., fig. 1, but the encircling skin of the young *B. quercus* larva is not shown. Mr. Bignell has described the jumping cocoons of *Limneria krieckbaumeri* (Entom. xv. 215); also the double-banded cocoons of *Casinarina vidua*, which is a frequent parasite of *Abraxas grossulariata*, at Entom. xiii. 246, now figured on Plate ii., fig. 11. A beautiful pendulous cocoon of a *Limneria*, bred from a young larva of *T. stabilis* by Mrs. Henry Jenkyns, is figured on Plate ii., fig. 27. At the meeting of the Entomological Society of London, on January 7th, 1839, a similar cocoon was exhibited, together with the *Campoplex*? bred, and which had remained in the cocoon for eighteen months. The curious cocooned larva-skins of *Gonepteryx rhamni* by *Limneria vulgaris* (see Plate ii., fig. 15) and of *Nola albulalis* by *Limneria fitchii* (see Plate ii., fig. 25), with the other references to the Plate, must be noticed later. Réaumur's observations on the pendulous and saltatory *Campoplex* cocoons surrounding the nests of *Cnethocampa processionea* is thus amply verified, although the parasitic species is not yet identified: see the interesting discussion at the Entomological Society (Proc. Ent. Soc. Lond., n. s., iii., pp. 27, 34, 35). The species exhibited by Mr. Curtis, "allied to *C. majalis*, Grav.," was not unlikely *L. krieckbaumeri*.

The Ophionidæ contain many of our commonest Ichneumons. The species of *Paniscus* are commonly seen throughout the summer, careering along a ditch with its heavy and somewhat lazy flight, resting on some leaf for a few seconds every few yards. The two common species of *Ophion* are not infrequent visitors at light, and their loud and incessant buzzing is sure to

attract immediate attention; they have also occurred at sugar. The puzzling species of *Campoplex* and *Limneria* occur almost everywhere. *Mesochorus* and *Exetastes* are garden insects; the species of the latter genus being commonly parasitic on low-feeding Noctuæ. *Scolobates* is very rare, being regarded by Marshall as doubtfully British. The rare *Arotes*, and commoner *Collyria* and *Pristomerus*, are doubtfully located here. Besides the beautiful figures in Curtis and Stephens, Ratzeburg figures many species in his 'Die Ichneumon;' and Vollenhoven gives useful outline figures of the genera in his 'Schetsen;' and Plates 28, 39, 3, 43 and 17 of his 'Pinacographia' relate to the Ophionidæ. There are a few other scattered figures in Donovan, Latreille, and Jurine.

The British genera may be thus tabulated:—

SECTION I.—First cubital cell receiving both the recurrent nervures.

A. Back of mesothorax rather smooth.

a. Discoidal cell with one or two yellow corneous spots. *Henicospilus*.

b. Discoidal cell without spots. - - - - - *Ophion*.

B. Back of mesothorax scabrous, rugulose. - - - *Nototrachys*.

SECTION II.—First cubital cell receiving only one recurrent nerve.

DIVISION I.—Abdomen petiolated.

A. Radial cell most frequently lanceolate.

SUBDIVISION 1.—Hind femora simple, without a spine in the middle beneath.

A. Metathoracic spiracles oval or oblong (in *Absyrtus* subrotund).

a. Claws of tarsi simple, not pectinated.

* Spiracles of 1st segment placed before the middle of the 1st segment. *Collyria*.

** Spiracles of 1st segment placed far behind the middle.

† Abdomen black, margins of segments yellow. - *Gravenhorstia*.

†† Greater part of the abdomen testaceous.

‡ Recurrent discoidal nervure of upper wing received in the middle of the 1st cubital cell.

§ First joint of hind tarsi about twice as long as the second.

× Apical margin of clypeus widely reflexed and bilobed. *Schizoloma*.

× × Apical margin of clypeus truncated. - - - *Exochilum*.

§§ First joint of hind tarsi four times longer than the second. *Heteropelma*.

†† Recurrent discoidal nervure received before the middle of the first cubital cell.

o Eyes nude.

+ Transverse anal nervure of lower wing divided. *Anomalon*.

- + + Transverse anal nervure not divided. - - - - *Agrypon.*
 oo Eyes hairy. - - - - *Trichomma.*
 b. Claws of tarsi pectinated.
 * Scutellum rather convex; areolet of wing present.
 † Spiracles of 1st abdominal segment placed before the middle.
 † Spiracles of metathorax elongate or oblong.
 § Supero-medial area of metathorax distinct. - - *Opheltes.*
 §§ Supero-medial area obsolete. - - - *Abyscus.*
 †† Spiracles of metathorax subrotund. - - - *Absyrtus.*
 †† Spiracles of 1st abdominal segment placed behind the middle.
Campoplex.
 ** Scutellum depressed, subquadrate; areolet of wings wanting.
Charops.
 B. Spiracles of metathorax circular, rarely subovate.
 a. Areolet of wings minute, subtriangular, subpentagonal, or none.
 * Clypeus not, or imperfectly, separated from the face.
 † Eyes hairy. - - - - *Cymodusa.*
 †† Eyes not hairy.
 † Apex of clypeus produced into a distinct tooth. - *Sagaritis.*
 †† Apex of clypeus not toothed.
 § Eyes against the antennæ distinctly emarginate; area of metathorax
 most frequently none, or next to none. - - *Casinaria.*
 §§ Eyes against the antennæ not, or only slightly, emarginate.
 × Head moderately large.
 o 2nd segment of abdomen transverse. - - - *Canidia.*
 oo 2nd segment of abdomen not transverse.
 + Head very much buccated; 1st segment of abdomen very short and
 rather stout. - - - - *Pyracmon.*
 + + Head transverse or subbuccated.
 + + Petiole of 1st segment of abdomen slender, not thickened, longer
 than the post-petiole. - - - - *Limmeria.*
 + + + 1st segment of abdomen short and rather stout; post-petiole a little
 shorter than the petiole. - - - - *Meloboris.*
 × × Head much wider than the thorax; abdomen narrow; aculeus long.
Nemeritis.
 ** Clypeus separated from the face; stigma of wing large.
 ∞ Abdomen in both sexes compressed; aculeus long; wings without
 an areolet. - - - - *Cremastus.*
 ∞ Abdomen in female most frequently compressed; depressed in the
 male; rarely depressed in both sexes; aculeus of female very
 short; areolet of wings subpentagonal, triangular, or very
 incomplete.
 Δ Abdomen of male depressed; 1st segment of abdomen shorter than
 the coxæ and trochanters of hind legs. - - *Atractodes.*
 ΔΔ Abdomen of both sexes depressed; 1st segment longer than the hind
 coxæ and trochanters. - - - - *Exolytus.*
 b. Areolet of wings large and rhomboidal; anal styles of male and
 aculeus of female exserted. - - - - *Mesochorus.*
 B. Radial cell of front wings rather short, subtrapezoid; radial and
 discoidal cells almost touching in the middle.
 * Antennæ with a moderate space between them; metathorax scarcely
 shorter than high. - - - - *Porizon.*

** The space between the antennæ most frequently very wide; metathorax much shorter than high. - - - *Thersilochus*.

Head small; wings sometimes without an areolet, transverse cubital nervure sometimes wanting; areolet when present a transverse rhomboid. - - - *Plectiscus*.

[This genus, originally formed by Gravenhorst, contained several small Ichneumons, which varied somewhat in important particulars. Haliday made the genus *Helictes* from some of these insects; and about the same time (1839) Schiödte described the genus *Megastylus*, containing Haliday's group of insects; but as Schiödte's paper was published a short time before the other it obtained priority. Holmgren has placed this genus amongst the Tryphonidæ. Förster (Verh. Nat. ver. preus. Rheinl. xxviii., 1871, p. 71) has published an elaborate monograph of *Plectiscus*, elevating the genus of Gravenhorst into a family, and dividing it into over 20 genera; and, as several of these have occurred in Britain, we have added a short table of them as subgenera:—

A. Wings with an areolet. - - - *Plectiscus*.

B. Wings without an areolet.

a. First joint of flagellum shorter than the second.

Second joint of flagellum in the male notched. - *Miomerus*.

b. First joint of flagellum as long as, or longer than, the second.

* Fifth to seventh joints of flagellum of male deeply notched.

Idioxenus.

** Fifth to seventh joints of flagellum of male not notched.

† Metanotum divided into two parts by a deep transverse depression. - - - *Dicolus*.

†† Metanotum not so divided; back part of head with a transverse ridge; stigma not narrow.

‡ Metathorax at the base not distinctly and regularly divided into areæ; antennæ more than thirty joints; abdomen depressed. - - - *Megastylus*.

†† Metathorax without distinct areæ at the base.

The apical joint of tarsi not thickened; transverse anal nervure distinctly interrupted; the first division of the radius interrupted, and with the second does not form a sharp angle; hind femora and tibiæ not thickened.

Proclitus.]

SUBDIVISION 2.—Hind femora armed with a spine in the middle beneath.

Pristomerus.

DIVISION II.—Abdomen sessile or subsessile.

A. All the tarsi slender.

a. Claws of tarsi not pectinated.

* Aculeus short. - - - *Exetastes*.

** Aculeus as long as the body. - - - *Arotes*.

b. Claws of tarsi pectinated; abdomen sessile. - - - *Banchus*.

B. Hind tarsi thickened; claws pectinated. - - - *Scolobates*.

THE STORY OF VALERIA OLEAGINA.

BY THE REV JOSEPH GREENE.

IN the year 1856 I sent to 'The Zoologist' (vol. xiv., p. 5073) a short article entitled "Adaptation of the Colouring of Moths to Autumnal Tints." At the close of it I asked whether any one could inform me in whose collection were to be found authentic specimens of the above insect. My object in doing so was to obtain some particulars as to when, where, and by whom it was discovered. From that day to this my question has remained unanswered. A few months ago I obtained some curious "fragments" of the 'Entomological Transactions.'* One of the papers is headed thus: "Review of the Rise and Progress of the Science of Entomology in Great Britain; chronologically digested. By A. H. Haworth, Esq., F.L.S., F.H.S., & P.E.S." It commences with the following words:—"It is the intention of the following paper to lay before the Society, in chronological order, an outline of the rise and progress of our favourite science in Great Britain, from its earliest dawnings to the present time." "The first entomological publication extant in these kingdoms, is an extensive one in folio, written in the Latin language, and published at London in the year of our Lord 1634 by Thomas Mouffet, entitled 'Insectorum sive minimorum Animalium Theatrum,' &c." He then gives a list in chronological order—accompanied by longer or shorter biographical notices—of the various writers down to his own time. Most of these are probably unknown to the present generation, but there are nevertheless some familiar names, as Petiver, Ray, Albin, Drury, Harris, Donovan, Martyn, &c. At page 56 he writes thus:—"James Sowerby, F.L.S., published, on the 1st of December, 1804, in octavo, at London, the first number of the 'British Miscellany, or coloured figures of new, rare, or little-known animal subjects, not before ascertained to be inhabitants of the British Isles; and chiefly in the possession of the author.' This number was followed by eleven others, at irregular periods,

* The work quoted is the "Transactions of the [old] Entomological Society of London, vol. i., part i.," which bears the date 1807 on its title page. In my copy, with original wrappers, parts i. and ii. were issued together on May 1st, 1809; but part i. (extending to page 112) was probably published separately, as the Rev. John Burrell corrects an error occurring on p. 61,—“in the former pages of our Transactions” (*l.c.*, p. 225).—E. A. F.

the last appearing on the 1st of August in the present year. The first five contained four plates each, and corresponding letter-press; and the remainder eight plates each, with similar descriptions. As the entomological articles of the 'British Miscellany' are not numerous, and the subjects in general very interesting, a slight enumeration of them is here subjoined; with, occasionally, such short remarks as the limited nature of this paper will consistently allow. On table (*i. e.*, Plate) the second, a *Papilio*, new to Britain, is figured, under the name of *P. blandina*, Fab., E. S. 736 nec 397, but which is, most probably, the *P. ligea* of Linnæus. It was caught in the island of Arran in Scotland. . . . Table 37 finely represents, as a new species, the rare *Bombyx oleagina* of Fab. and of Lep. Brit., and *Noctua oleagina* of Hüb. Schmet., cum icone. I have seen Mr. Plastead's specimen, here mentioned, several years since; which that gentleman dug the pupa of in Battersea fields, along with *Noctua persicariæ*; and have also seen another which was caught in Scotland twenty years ago; and my friend Mr. Donovan, F.L.S., found one in Wales."* And so here at last, after so many years, I find an answer to my question! Can any of your readers inform me whether the three specimens above referred to are still in existence?† There can be no reasonable doubt, I should imagine, as to their being genuine British specimens. It seems very strange, considering the number and indefatigable zeal of collectors since that period, that no other example, so far as I am aware, has since been taken. It is the more remarkable, when we consider the widely-separated localities in which the above were taken, *viz.*, Battersea, Scotland, and Wales! One more quotation may, I think, be interesting:—"In the same year (1770) we arrive at the time of the publication of a beautiful work on Entomology, that of my late and regretted friend D. Drury, F.L.S., in one vol. 4to. . . . Mr. Drury's cabinet was one of the most extensive ever made; and is said to have contained in species and varieties the surprising number of 11,000 insects. He spared no pains or cost in getting them together; and, like Petiver of old, sent printed instructions, in

* Donovan ('British Insects,' vol. xiii., pl. 439) states that he took his specimens on the wing, by a low hedge, near Fishguard, Pembrokeshire, in July, 1800.

† Newman ('British Moths,' p. 401) mentions that the specimen in the Entomological Club collection is from the late Mr. Haworth's cabinet. The collection is under the care of Mr. B. T. Lowne, and still contains the insect in question.

various languages, all over the world for that purpose, by means of captains and others. Soon after his decease, at an advanced age, his valuable collection was disposed of in London by public auction. The sale occupied three days, and was by much the most considerable one of its kind ever known, producing about £650; one single insect in it selling for no less a sum than twelve guineas."* We entomologists have been subjected to a good deal of light banter from the 'Times' and other papers in reference to the prices fetched at the recent sale of Mr. Harper's collection. It may be a consolation to us to learn that our great-grandfathers exhibited a similar amiable weakness in this department. It seems to me far more rational, or at any rate far more excusable, to give thirteen guineas for a rare or beautiful insect than ten or twenty times that sum for a bit of old ugly china!

Clifton, Bristol, May 8, 1884.

ON SETTING LEPIDOPTERA UNPINNED.

BY GEORGE COVERDALE.

SOME time ago it occurred to me that if we could prepare our insects for the cabinet without pinning them through the thorax several important advantages would be secured, especially in reference to the smaller genera of the Micro-Lepidoptera, where the difficulties of setting become so formidable that many are deterred from entering upon the study of those most interesting and beautiful creatures.

The anticipated advantages were threefold. In the first place the process of setting the insects would be much facilitated, a large proportion of the difficulties encountered being due to the action of the pin in displacing or destroying the muscles of the thorax, and the wings thereby frequently thrown into awkward and obstinate positions. Indeed, to pin a *Nepticula* at all is not of the easiest accomplishment, and quite impossible to some. Secondly, there being no pin through the insect, all chance of verdigris would be removed. This danger, it is true, is sufficiently met by the use of black pins, but these are often soft and bending, occasionally pointless, and comparatively

* The elder MacLeay bought lot 95—a male *Goliathus drurii*—for £12 1s. 6d., at the King Street auction rooms, on May 23rd, 1805,—E. A. F.

thick. Again, in moving insects about, the chance of such a mishap as a body flying off, or the pin giving way, would be reduced to a minimum. Thirdly, under the present system characteristic markings and structures of the thorax are frequently obliterated or destroyed, and it is not uncommon to find one or more of the legs carried away by the pin. With insects unpinned this could not be the case.

These considerations induced me to devote some time to the subject, and, after numerous experiments and almost as numerous failures, a simple method has been devised, the results of which are in every respect encouraging and satisfactory.

To ensure success in the process adopted a careful attention to matters of detail is imperative. Supports for the insects are prepared by cutting blocks of corks (about a sixteenth of an inch long), and a small pin passed through each one. At right angles to this another and longer pin is pushed about half its length through the cork, so that when the large pin is stuck upright in the setting-board the small one is parallel with its surface. Numbers of these supports can be made in a very few minutes, and when once made will last for a long time. The insect, after being killed, is placed upon its back on a glass plate, a 3 in. by 1 in. microscopic slide answering the purpose admirably. A drop of "coaguline" is now put on to the small pin, which is then gently pressed against the under side of the thorax, causing it to adhere to the pin. If this has been neatly and quickly done the insect is firmly fixed along the pin by the under side of the body, with its head towards the cork block. The wings and antennæ may now be blown out, the support fixed into the groove of the setting-board by the large pin, and the insect set in the usual way. After drying and the removal of the braces the slightest jerk given to the pin, or the gentle heat from a hot needle, will detach the insect from its support. Finally it is mounted with gum tragacanth on little blocks of elder-pith, through which a pin has been passed. The head should be made to project a little beyond the pith-block, so as to enable the palpi, &c., to be examined from beneath. The glass plate is used to avoid a rough surface, which might remove some of the scales from the wings. Kay's Coaguline is found to be the best for fixing the insect to the pin, on account of its rapid coagulating properties. Gum tragacanth is preferable for the

final mounting, as it is more transparent than "coaguline," although it does not dry so quickly.

Tedious as this process may appear in description, it is in practice simple and expeditious. By means of it this spring I have set *Nepticula microtheriella*, *N. septembrella*, *N. viscerella*, *N. marginicolella*, *N. catharticella*, &c., *Cemiostoma laburnella*, many species of *Lithocolletis*, *Micropteryx*, *Argyresthia*, &c., all of which will bear comparison with the best of those set in the usual manner. During the season a more extended use will be made of the system; in the meantime I shall be happy to render any assistance to those who may consider the process worth a trial.

24, Fleming Road, Lorrimore Square, S.E., May 8, 1884.

A FORTNIGHT'S COLLECTING IN SICILY.

By J. H. LEECH.

It may interest some of the collectors of European insects to hear the results of my short sojourn in Sicily. I arrived at the end of March under rather unfavourable circumstances, the weather being extremely windy and by no means as warm as I had been led to expect. The landlord of the "Hotel des Palmes," M. Envier Ragusa, is an enthusiastic entomologist, and showed me with just pride his excellent Sicilian collection. In his natural love for his native fauna he pointed out Sicilian specimens of *Vanessa io* with as much pride as an Englishman would a British *Vanessa antiopa*.

The Sicilian fauna corresponds in many ways to our British on account of its insular character, many species which are quite common in Italy being either entirely absent or extremely rare, and insects also occurring there found nowhere else, for instance, *Melanargia pherusa*, and many others both among the Lepidoptera, the Coleoptera, and Hymenoptera.

The island has also many species in common with Sardinia and Corsica, as the curious *Apochima flabellaria*, and, like those islands, does not contain a single species of *Erebia*, although having high mountains and an extensive alpine fauna. However, it is extremely rich in new forms, and, if well worked, would be certain to produce abundance of novelties, especially among the Micro-Lepidoptera and the Hymenoptera. The latter, by the way, are being energetically sought out by a Mr. de Steffanie,

who has devoted much time to them and found many new species, the most beautiful of which I was fortunate enough to take a specimen, viz., *Chrysis trinacria*; although not a collector of Hymenoptera, it was such a lovely insect that I took it, and was glad to have done so when I found out what it was.

I was disappointed to find myself fully a month too soon for the Lepidoptera, so devoted most of my time to Coleoptera, in the acquisition of which I was very successful, bringing in daily from 200 to 300 specimens, mostly different, and many very minute. Collecting in Sicily is indeed a pleasure, and well worth the four days' journey from England; the country, in sheltered spots, seemed literally alive with insect-life, and, if it had not been for the wind, would have been perfect. It seemed almost sacrilegious, strolling among the remains of some grand Greek temple left untouched for generations, and in quest of beetles, overturning fragments of columns which had rested undisturbed since the day they fell, yet such spots were often the most productive of good species, notably the temples at Girgente. Sand-hills on the coast produced many good things, so did the banks of streams, especially the stream at Bella Strade. *Cicindela littoralis* and var. *nemoralis*, and *C. flexuosa* and var. *circumflexa*, were to be seen running all over the mud-banks, and the curious little *Omophron limbatus*. I found the best way to procure the smaller species was to throw water on to the mud or sand, and so drive them out; but the best all-round collecting-ground is the Favorita, at Palermo; there are some open water-courses for the purpose of irrigation, generally nearly dry, which produce swarms of species. Sweeping was fairly productive, but searching flowers more so.

Mimicry among various orders of insects was very noticeable, especially between the Arachnidæ and Coleoptera, and I often watched the spider, half-hidden in the centre of a flower, seize the unfortunate beetle, who had evidently mistaken it for one of its own species. The plant-bugs also resembled Coleoptera, especially small Longicorns, though for what purpose I was not able to find out; probably for their own protection, or possibly for the protection of the species they imitated. Although interesting, yet one gets tired of being imposed on by insects one cares nothing about, and, from a collecting point, mimicry is a nuisance when it occurs to the extent it does in Sicily.

There is not the least fear to be apprehended from the natives, brigandage being quite a thing of the past. I found the peasantry most obliging; whenever I met any I used to explain, in broken Italian, my occupation, and they generally assisted me, often becoming an intolerable bore. I used to carry a box on purpose to put their unwelcome gifts into, so as to avoid offending them; snails, grasshoppers, small frogs, &c., were common offerings, and of course were disposed of as soon as the donor's back was turned; but one was sometimes rewarded by a good species. They never minded how much one trampled through their corn or orange groves, and seemed pleased to see a stranger, unlike our noble countrymen.

The best time to go to Sicily would be from the middle of May to the end of June, and the weather would be delightful in the mountains. I unfortunately had to leave when the good time was just beginning. I conclude by giving a list of some of the most interesting insects I took. The small beetles and the Micro-Lepidoptera I have not yet had time to identify.

LEPIDOPTERA.

| | |
|---|---|
| Papilio machaon, <i>var.</i> sphyrus.—P. | And many butterflies common in |
| podalirius. | England. |
| Thais polyxena. | Arctia caja. |
| Pieris daphidice. | Spilosoma fuliginosa. |
| Anthocharis belia.—A. cardamines, | Metoptria monogramma. |
| <i>var.</i> turritis. | Heliothis dipsaceus.—H. peltigera. |
| Colias edusa. | Acontia lucida, <i>ab.</i> albicollis.—A. |
| Rhodocera cleopatra. | luctuosa. |
| Polymmatas phlæas, <i>var.</i> eleus. | Thalpochares ostrina. |
| Lycæna baton. | Botys polygonalis.—B. amata.—B. |
| Cænonympha pamphilus, <i>var.</i> lyllus. | sanguinalis.—B. ferrugalis. |

COLEOPTERA.

| | |
|---|-----------------------------------|
| Cicindela campestris, <i>var.</i> nigrita.— | Calathus circumscripta. |
| C. littoralis, <i>var.</i> nemoralis.— | Harpalus cupreus. |
| C. flexuosa, <i>var.</i> circumflexa. | Ditomus flavipes. |
| Omophron limbatus. | Acinopus ambiguus. |
| Notiophilus palustris.—N. rufipes. | Feronia splendens. |
| Carabus morbillosus, <i>var.</i> servillei. | Aristus capito.—A. clypeatus.—A. |
| Masoreus ægyptiacus. | sphærocephalus. |
| Chlœnius auricollis.—C. spoliatus.— | Brachinus sclopeta.—B. crepitans. |
| C. chrysocephalus.—C. velu- | Polistichus fasciolatus. |
| tinus.—C. circumscriptus. | Silpha sinuata.—S. granulata. |
| Lionychus brevicollis, <i>var.</i> sicula. | Sunius longicornis. |
| Brosicus politus. | Hister major.—H. 12-striatus. |
| Scarites buparius.—S. arenarius. | Oxythyrea stictica. |

- Cetonia squalida*. — *C. hirta*. — *C. floralis*.
Trachys pygmaeus.
Capnodis cariosa. — *C. tenebrionis*.
Anthaxia viminalis.
Acmæodera discoidea.
Dasytes algineus.
Dolichosoma nobile.
Drilus flavescens.
Malachius parilis.
Erodium, *var. siculum*, *var. vicinus*.
Pachychila dejeani. — *P. cossyrensis*.
— *P. frioli*.
Teutgria grosse.
Stenosis sardia, *var. major*.
Acis spinosa. — *A. atrata*.
Blaps mucronata. — *B. gages*.
Pimelia rugosa. — *P. sardia*. — *P. inflata*.
Sepidium siculum.
Pedium punctatostriatus.
Opatus validum.
Trichodes alvearius, *var. dahlii*.
Meloe zuccius, *var. carossa*. — *M. erythrocnemus*. — *M. murinus*.
Hybalus dorcas.
Geotrupes lævigatus.
- Ateuchus pius*. — *A. semipunctatus*.
— *A. variolosus*.
Gymnopleurus mopsus.
Copris hispanus.
Bubas bison. — *B. bubalis*.
Onthophagus taurus.
Cartallum ebulinum.
Phytæcia rufimana. — *P. virescens*.
Cryptocephalus rugicollis, *var. 6-notatus*, *var. verrucosa*.
Timarcha pimilioides.
Chrysomela atra. — *C. banksii*. — *C. sparshalli*. — *C. palustris*. — *C. grosse*.
Malacosoma lusitanica.
Cassida depressa.
Lytta segetum.
Brachycerus mauritanicus. — *B. undatus*. — *B. albidentatus*. — *B. cirrosus*. — *B. oculatus*.
Agryphus hæmarensis.
Anisorynchus monochus.
Cleonus cinereus.
Lixus paraplectus.
Agapanthia asphodeli. — *A. acutipennis*. — *A. cardui*.

This list mentions only the more conspicuous insects, the greater part of those collected being not yet identified. I was fortunate enough during my short stay to discover several insects new to the island, so a collector, choosing a better season and spending more time, ought to do great things.

15, Rose Crescent, Cambridge, April 22, 1884.

CONTRIBUTIONS TO A LIST OF THE LEPIDOPTERA OF THE SOUTH-EAST COAST.

BY A. H. SHEPHERD.

THE under-mentioned list of species, taken during August only, between Sandwich and St. Margaret's Bay, Kent, may be of interest to those collectors who may not yet have paid a visit to that locality:—

Pieris brassicæ and *P. rapæ*, common everywhere.
Colias edusa, occasionally all round the coast.

Vanessa urticæ, *V. io*, *V. atalanta*, and *V. cardui*, all round the coast; the last species occasionally swarms.

- Arge galathea*, common on grassy banks, most plentiful between Walmer and St. Margaret's Bay.
- Satyrus janira*, very common all round the coast.
- Chortobius pamphilus*, very common.
- Polyommatus phlæas*, common everywhere.
- Lycana agestis*, common all round the coast.
- L. alexis*, very common; varieties are occasionally met with.
- L. corydon*, plentiful, but local, between Walmer and St. Margaret's Bay; some nice varieties of this species are sometimes met with.
- L. alsus*, rather local, Walmer to Kingsdown.
- Hesperia sylvanus*, plentiful.
- H. comma*, rather local, Kingsdown to St. Margaret's Bay.
- H. linea*, plentiful.
- Acherontia atropos*, the larvæ and pupæ are not uncommon, the imago I have not met with.
- Macroglossa stellatarum*, very common; the larva is of frequent occurrence also.
- Hepialus lupulinus*, very common at dusk.
- Zygæna filipendulæ*, plentiful, but rather local; varieties are sometimes to be taken.
- Lithosia lurideola*, occasionally near Kingsdown.
- Callimorpha dominula*, plentiful, but local, Walmer to St. Margaret's Bay; this seems to be a very sluggish insect, may be found during the daytime at rest among herbage, brambles, &c.
- Liparis chrysorrhæa*, very plentiful, but local; may be taken on the wing at dusk flying round hedges.
- L. auriflua*, very common, hedges in lanes at dusk.
- L. salicis*, not uncommon, lanes near Sandwich and Deal.
- Bombyx neustria*, not uncommon in lanes.
- B. quercus*, occasionally near Walmer.
- Odonestis potatoria*, not uncommon near Sandwich.
- Rumia cratægata*, very common.
- Selenia illunaria*, occasionally in lanes.
- Odontopera bidentata*, lanes near Kingsdown.
- Crocallis elinguaris*, lanes near Kingsdown.
- Boarmia rhomboidaria*, not uncommon in lanes.
- Gnophos obscurator*, occasionally common, but local, Kingsdown to St. Margaret's Bay; nice varieties are occasionally met with.
- Asthenes candidata*, common.
- Acidalia scutulata* and *A. bisetata*, common.
- A. ornata*, not uncommon, but rather local, Walmer to St. Margaret's Bay.
- A. incanaria*, occasionally taken.
- A. promutata*, occasionally near Kingsdown.
- Acidalia straminata*, not common.
- A. aversata*, rather common.
- Timandra amatoria*, occasionally taken in lanes, but not common.
- Strenia clathrata*, a few specimens have been taken.
- Fidonia atomaria*, of local occurrence, plentiful.
- Aspilates citraria*, very local, between Sandwich and Deal, most plentiful in that part known as "the sandhills," but sometimes met with near Walmer.
- A. gilvaria*, also a local species, but much more distributed than the last-named species, Walmer to St. Margaret's Bay, "plentiful."
- Emmelesia unifasciata*, once only near Walmer.
- Eupithecia centaureata*, of general occurrence.
- E. absynthiata*, occasionally; also the larvæ.
- E. minutata*, occasionally, Kingsdown to St. Margaret's Bay.
- Melanthia ocellata*, not uncommon near hedges.
- Melanippe unangulata*, of general occurrence.

M. subtristata, not uncommon.

M. galiata, not uncommon, but local, Kingsdown to St. Margaret's Bay.

M. fluctuata, general occurrence.

Coremia ferrugata and *C. unidentaria*, rather common.

Camptogramma bilineata, common in lanes.

Eubolia mensuraria, not uncommon.

E. bipunctaria, very plentiful, although local.

E. lineolata, very local, Sandwich to Deal; the larva occurs on the sandhills.

Bryophila perla, of general occurrence on walls.

Acronycta aceris, larvæ taken occasionally near Kingsdown.

Leucania conigera, occasionally taken, Walmer to Kingsdown.

L. lithargyria, a few specimens have been taken.

Leucania obsoleta, of occasional occurrence.

L. phragmitidis, occasionally, Sandwich to Deal.

Hydræcia nictitans, a few specimens near Sandwich.

Xylophasia polyodon, common, lanes near Deal.

Miana strigilis, not uncommon.

M. furuncula, plentiful, Walmer to St. Margaret's Bay.

Caradrina cubicularis, not uncommon.

Agrotis tritici, occasionally taken near Kingsdown.

Triphæna pronuba, common everywhere.

Noctua xanthographa, occasionally near Walmer.

Eremobia ochroleuca, of general distribution.

Dianthæcia carpophaga, the larvæ are not uncommon near Walmer on bladder-campion (*Silene inflata*).

D. capsicola, the larvæ occur in the lanes near Deal.

Phlogophora meticulosa, very common.

Plusia gamma, very common everywhere.

Amphipyra tragopogonis, once only near Sandwich.

Phytometra ænea, of general occurrence; strongly marked specimens are sometimes met with.

Hypena proboscidalis, not uncommon near Walmer.

Rivula sericealis, occasionally, Kingsdown to St. Margaret's Bay.

Herminia barbalis, occasionally.

Pyralis glaucinalis, not uncommon, but rather local.

Pyrausta punicealis, *P. purpuralis*, and *P. ostrinalis*, of general occurrence.

Herbula cespitalis, occasionally.

Ennychia anguinalis, occasionally, Walmer to St. Margaret's Bay; rather active on the wing.

Cataclysta lemnalis, plentiful, but local, Walmer and Sandwich.

Botys pandalis, not common, Walmer to Kingsdown.

B. verticalis, common.

B. urticalis, occasionally very common.

Pionea forficalis, rather common.

Spilodes palealis, not uncommon, but rather local.

Scopula prunalis, of common occurrence.

S. ferrugalis, of general occurrence.

Stenopteryx hybridalis, this species is sometimes very plentiful.

Scoparia ambigualis, occasionally with *S. basistrigalis* and *S. cembralis* near Walmer.

Crambus pratellus, very common.

C. perlellus, occasionally.

C. tristellus, generally common.

C. inquinatellus, occasionally taken.

C. geniculellus, plentiful, but local, near Sandwich, and sparingly near Walmer.

C. culmellus, not uncommon.

Onocera ahenella, once only near Walmer.

Melia sociella, occasionally taken.

Peronea variegana, *P. hastiana*, and

P. aspersana, a few specimens have been taken.

Aspis udmanniana, occasionally.

Orthotænia striana, a few specimens near Walmer.

Sciaphila perterana, *S. subjectana*, and *S. virgaureana*, specimens are occasionally taken.

Grapholitha nigromaculana, not common.

G. campoliliana, occasionally.

Hypermercia angustana, occasionally, Kingsdown to St. Margaret's Bay.

Catoptria hohenwarthiana, not uncommon.

Cochylis stramineana and *C. giganteana*, rather common, Kingsdown to St. Margaret's Bay.

Aphelia pratana, occasionally.

Tineæ were not looked after, and only a few species were noticed, viz.:—*Tinea pallescentella*, *Plu-*

tella xylostella, *Depressaria litarella*, *D. nanatella*, *D. atomella*, *D. heraceliella* (larvæ), *Gelechia malvella*, *G. mulinella*, *Nothris durdhamella*.

Pterophori:—*Pterophorus acanthodactylus*, not uncommon.

P. plagiodyctylus, occasionally, Deal to Sandwich.

P. fuscodyctylus, rather common, Walmer to Kingsdown.

P. lithodyctylus, not uncommon.

P. pterodyctylus, occasionally, Deal to Sandwich.

P. microdactylus, rather plentiful, but somewhat local.

P. baliodactylus, occasionally, Kingsdown to St. Margaret's Bay.

P. tetradactylus, once only, Walmer to Kingsdown.

P. pentadactylus, common, Kingsdown to St. Margaret's Bay.

This list of nearly one hundred and fifty species was taken, with a very few exceptions, during the daytime only, my health not permitting night work; otherwise no doubt the list would have been a much longer one. At the same time I may remark that the few occasions on which I have tried sugar produced little or nothing worth taking. If lists somewhat like the above for other months were contributed it would, I think, be interesting to many collectors.

4, Cathcart Street, Kentish Town, London, March, 1884.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEPIDOPTERA NEAR LONDON.—I should like to bear out the experience of Mr. T. W. Hall as regards the fairly plentiful occurrence of Lepidoptera in South London last year. In a small district I worked I found enough to afford consolation, after spending several nights in other quarters with no success whatever. I am unable to state anything about the Diurni, as I had no opportunity for observing them; but these are not likely to have been many; nor have I much to say of the Geometers, as it was amongst the Noctuæ I did most work. The only

species of the former group noticed last year were *Selenia illunaria*, *Metrocampa margaritaria*, *Acidalia aversata*, *Rumia cratægata*, *Cabera pusaria*, *C. exanthemaria*, *Anticlea derivata*, *Melanippe subtristata*, *Panagra petraria*, *Ypsipetes elutata*, and *Aspilates strigillaria*. As regards the Noctuæ, however, I think my list is a fairly good one for the season. In the spring time, at fallows, were to be found *Tæniocampa stabilis*, *T. instabilis*, *T. cruda*, and *T. gothica*. At sugar, during the summer and early autumn, were taken the following:—*Acronycta psi*, **A. leporina*, *Leucania lithargyria*, **L. pudorina*, *L. comma*, *L. impura*, *L. pallens*, *Hydræcia nictitans*, *Xylophasia lithoxylea*, *X. polyodon*, *X. hepatica*, *Dipterygia pinastri* (in fair abundance), *Apamea gemina*, *A. oculea*, *Miana strigilis*, *M. furuncula*, *Grammesia trilinea*, *Rusina tenebrosa* (very common), *Agrotis suffusa*, *A. segetum*, *A. exclamationis*, *A. corticea*, *Triphæna janthina*, *T. orbona*, *T. pronuba*, *Noctua glareosa*, *N. augur* (plentiful), *N. plecta*, *N. c-nigrum*, *N. triangulum*, *N. festiva*, *N. rubi*, *N. baja*, *N. xanthographa*, *Orthosia lota*, *Anchocelis pistacina*, *A. lunosa*, *A. litura*, *Xanthia cerago* (very common), *X. silago*, *X. ferruginea*, *Cosmia trapezina*, *Hecatera serena*, *Phologophora meticulosa*, *Euplexia lucipara*, *Aplecta nebulosa*, *Hadena proteus*, *H. chenopodii*, *H. oleracea*, *H. pisi*, *Plusia gamma*, *Amphipyra tragopogonis*, and *Catocala nupta*. In addition to these I took on the wing *Chortodes arcuosa* (very plentifully), *Tapinostola fulva*, and *Euclidia mi*; at lamps, **Luperina cespitis*, *Gortyna flavago* (several); and at rest, three *Acronycta aceris*. Of those marked with an asterisk only single specimens were taken. Another collector took, in addition, in the same locality, *Euthemonia russula* (in fair numbers), one *Geometra papilionaria*, one *Notodonta dictæa*, and several *Agrotis porphyrea*. Of course I am aware that there are no really good things in the above list of sixty-one species of Noctuæ; but it is, I think, sufficiently comprehensive to show that in some few localities there were exceptions to the almost universal dearth of even common insects.—J. E. TARBAT; Cambridge, April 21, 1884.

PAPILIO MACHAON IN SURREY.—It may interest the readers of the 'Entomologist' to know that I have just found a pupa of *Papilio machaon* in a field abounding with wild carrot plants, and near a marshy piece of ground. It was found suspended to a dead twig. There is a mention, in Newman's 'British Butter-

flies,' of *Papilio machaon* having been caught at Battersea, but there is no recorded capture anywhere else in Surrey.—BRUCE G. SETON; Derwent House, Anerley, Surrey, May 13, 1884.

PIERIS BRASSICÆ, VAR.—Out of 160 larvæ of *Pieris brassicæ* taken in October three have up till now safely reached the imago stage. One of these is a curious variety, the extreme expanse of wings being $1\frac{2}{3}$ in., and the specimen having none of the usual markings, this being a male, except the tips of the fore wings, which are very faintly marked with black. The other two are ordinary male and female specimens.—G. F. G. WILDES; Kirtling, Newmarket, May 7, 1884.

REPORTED CAPTURE OF PYRAMEIS HUNTERA.—It may interest some of your readers to know that I took a variety of *Pyrameis cardui*, var. *Pyrameis huntera*, about four years ago in a lavender field at Hitchin.—F. H. BARCLAY; Leyton, Essex.

[*Pyrameis huntera*, Fab., is a synonym of *P. virginicensis*, Dru., a North American species. It was formerly a reputed British species, but no one holds that view now. It is possible that Mr. Barclay has taken a variety of *P. cardui*, but we imagine not *P. huntera*, which is not a variety, but a good species.—ED.]

LYCÆNA ARGIOLUS AND THECLA RUBI IN N. WARWICKSHIRE.—These two species were extremely plentiful this year in Sutton Park (N. Warwickshire). The males of the former, as usual, average about twelve to one to the females. They were rather late in making their appearance this year, perhaps owing to the recent rough weather, and many of the nights in April were frosty. In 1882 *L. argiolus* was seen on April 7th; this year it was a month later.—W. HARCOURT BATH; 2, Edmund Street, Birmingham, May 16, 1884.

DEIOPEIA PULCHELLA AND ACRONYCTA ALNI.—When I began collecting Lepidoptera some few years ago I formed the nucleus of my collection with a few species my elder brother had taken at Repton, in Derbyshire; amongst them was the rare *Deiopeia pulchella*. When he returned from abroad this year, where he has been for some time, I asked him about it. He took it, he said, on a brick wall in the autumn of 1874 at Repton. I am not aware that it has been captured in that neighbourhood before. On June 9th, 1883, I took a finely-marked, but small, specimen of

Acronycta alni at Wimbledon.—LYONELL FANSHAW; 2, Halkin Street West, Belgrave Square, S.W., April 27, 1884.

PUPATION OF *ERIOGASTER LANESTRIS*. — The following remarkable case of pupæ standing over for several seasons may not be without interest to some of your readers. In the autumn of 1880 I had half a dozen pupæ of *Eriogaster lanestris* sent me. One emerged in the spring of 1881, the remainder standing over until 1882. In the spring of that year another emerged. In 1883, no other emergence having taken place, I opened two pupæ, when I found that both contained fully-formed and living imagines, which crawled about for some days, but, as might be expected, their wings were not developed. During the present month (March, 1884), thinking the two remaining pupæ must certainly be dead, I opened them, and found the first one contained a dead imago; but on opening the second, to my surprise, a living imago was liberated, which immediately crawled upon a dead leaf, and its wings were soon developed to the normal size. I have never had pupæ stand over so long before, although delay for two seasons seems to be a common occurrence. — J. W. TUTT; 45, Beaconsfield Terrace, East Greenwich, S.E., March 15, 1884.

HYBERNIA PROGEMMARIA, VAR. FUSCATA. — In answer to your correspondent in the last number of the 'Entomologist,' he may be interested to know that I took this variety at light in March, 1883, in Sutton Park. I frequently come across very dark varieties also of *H. defoliaria* in the autumn in the woods near here.—W. HARCOURT BATH; Birmingham, May 16, 1884.

PETASIA NUBECULOSA, RETARDED EMERGENCE. — In 1881 I reared some twenty larvæ of *Petasia nubeculosa* from Rannoch eggs; they were full-fed about the end of June, and duly went to earth. In the following spring I vainly searched the breeding-cage for imagines, and the early months of 1883 having passed with a no more favourable result, I concluded that the larvæ had died instead of pupating. To my surprise and pleasure, on looking into the cage on March 22nd of the present year, I discovered a moth just emerged from pupa; this was followed by others on the 23rd, 24th, 29th, and 31st, in all five, which (with the exception of the first, which was very slightly crippled) are fine well-developed specimens. — ROBERT ADKIN; Lewisham, May, 1884.

EPUNDA LUTULENTA AND VARS.—The varieties *luneburgensis* and *sedii* both occur in this district. By *luneburgensis* I mean the dark form almost as black as *Epunda nigra*, but with the central bar clearly visible in certain lights; and by *sedii* the ashy-gray form with very distinct darker central bar. Neither of them have any superficial resemblance to what I believe to be the ordinary English *Epunda lutulenta*, which I take to be a dull smoky brown, nearly unicolorous, insect, by no means so handsome as either of the varieties named. This form, so far as my experience goes, does not occur here. In one of my specimens of *luneburgensis*, a male, there is a distinct wavy dark central line across the upper side of the under wings; and in another, a female *sedii*, the same wavy line occurs, but is pale on the dark ground, or exactly reversed. If possible, it is my intention this autumn to obtain eggs from both varieties, and see if they are constant. I should also be glad to obtain, in exchange for some of mine, eggs of the English *Epunda lutulenta* to compare the larvæ.—PERCY H. RUSS; Culleenamore, Sligo, May 13, 1884.

CUCULLIA SCROPHULARIÆ (Hübner) TWO YEARS IN PUPA.—On July 8th, 1882, I found seven larvæ of this moth on *Scrophularia nodosa*; they all went into pupa in about a fortnight, but none appeared in the perfect state during 1883. One, however, came out, a fine and perfect specimen, on April 26th in the present year (1884). I am not aware that this species has before been known to remain two years in the chrysalis state.—O. P. CAMBRIDGE; Bloxworth Rectory, May 1, 1884.

DESCRIPTION OF THE LARVA OF *HOMÆOSOMA NEBULELLA*.—On August 18th, 1882, I received a supply of withered flower-heads of thistle (*Carduus*), containing larvæ of this species, from the Rev. H. Williams, of Croxton, Thetford:—Length five-eighths of an inch and stout, cylindrical, tapering a little at both extremities. Head small, narrower than the 2nd, and still narrower than the 3rd, segment; segmental divisions deeply cut, and there is also a transverse depression, but not so deep, on each segment. Ground colour dingy greenish yellow; head brown, with darker sienna-brown mandibles, and a few prickles of the same colour above the mandibles; frontal plate sea-green, edged behind with smoke-colour. Dorsal stripe broad, dingy purple; subdorsal stripes of the same colour, but still broader; and there is an equally broad stripe of the same colour along the

spiracular region, but this stripe is interrupted at the segmental divisions, and has also running through it a waved line of the ground colour. The purple stripes form the prevailing colour of the dorsal area, and might almost be taken as the ground colour; spiracles black; ventral surface dingy greenish yellow, variegated with purple marks, the legs barred with black. I bred no imagos the following year, but specimens of a pretty chalcid, *Monodontomerus æreus*, two species of Diptera, *Trypeta serratulæ* and *T. solstitialis*, and about a dozen specimens of a small hemipteron emerged from the thistle-heads.—G. T. PORRITT; Huddersfield, May 12, 1884.

THE DEATH WATCH.—Are there not two insects, producing very different sounds, commonly known by superstitious people under the above name? I have very frequently heard the watch-like “tick, tick” of one of them, but a few days ago my attention was called to another “death watch,” which made a quick succession of raps, reminding one of the woodpeckers. In this part of the country the natives are pretty unanimous in attributing all these sounds to a spider. Of course this is only folk-lore.—W. MACMILLAN; Castle Cary.

THE BIRMINGHAM NATURALISTS' FIELD CLUB.—This Club, which was formed in 1882, is composed chiefly of entomologists. It has been arranged to read the following papers relating to Entomology during the summer session:—April 23rd, “British Butterflies,” by W. Whitehouse, Soho Branch; June 11th, “The Geometræ,” by A. R. Pimm, Central Branch; July 16th, “Ants,” by F. Spearman, Soho Branch; July 23rd, “The Motions of Insects,” by A. R. Pimm, Central Branch; August 13th, “Some Species of Lepidoptera injurious to Agriculture,” by W. Harcourt Bath, Central Branch. The General Secretary is Mr. A. R. Pimm, 60 Lionel Street, Birmingham.

LOCAL LIST OF LEPIDOPTERA.—It is pleasing to find that Mr. John W. Ellis, the Hon. Sec. of the Lancashire and Cheshire Entomological Society, has undertaken, at the request of that Society, the compilation of a list of the Lepidoptera known to occur in those counties. He has appealed for the assistance of those who have collected over the locality, and will furnish them with printed lists to fill in. His address is 101 Everton Road, Liverpool.—JOHN T. CARRINGTON; Savage Club, Savoy, London, May, 1884.

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RANNOCH.

BY JOHN T. CARRINGTON, F.L.S.

(WITH MAP.)

DURING the last few weeks I have had no less than a dozen enquiries from lepidopterists—some young and some old hands—as to the best way to get to Rannoch, and what to do on arriving there. As the demands upon my time are only too numerous, I have promised to answer them—and possibly at the same time interest others of our readers—by giving a description in these pages of that most charming entomological locality. I must, however, apologise for any shortcomings, as it is now nearly ten years since I visited Rannoch; but with the help of the accompanying map, and of my notes taken at the time, I have no doubt I can give intending collectors sufficient information to form a basis for good work on their part.

It will be found of the first importance by visitors from the south to travel by the right train to Scotland, so as to arrive at Struan Station by the mail train from Perth. Struan is on the Highland Railway, is some forty miles north of Perth, and is the station for Kinloch Rannoch, which is about twelve miles distant by road. The importance of reaching Struan by the mail train, which should get there at 10 o'clock in the forenoon, lies in the fact that it is met by a post-car, on which seats for Kinloch may be secured for two or three shillings; whereas if one arrives at any other time of the day one must hire specially at post-horse rates, or remain the whole day and night, which would be comparatively wasted at Struan. The visitor should not

be too sure that such seat will be at his disposal, and he had better write a few days previously to the post-master of Struan, on whose kind offices he may rely, to secure for him a place.

We Londoners will imagine that we have left Euston Square Station at 8.50 in the evening, and slept most of the way to Perth, as every entomologist should, if he only leaves behind him the cares of his every-day business, which all who intend having a real holiday would do naturally. Then there is a short time for a little breakfast, and a change on to the Highland line. For the first few miles after leaving Perth the scenery will fully occupy his attention, especially between Pitlochrie and Blair Athol, when the train passes through the celebrated Pass of Killiecrankie; and, by the way, I may mention that the left-hand corner of the carriage, when facing the engine, will be found the best place for observing the scenery.

At last, seated on the post-car for Kinloch, we pass through a wild and not too inviting country. Wild, however, as it appears to the newly-imported "Sassenach," it is nothing when compared with the scenery a few miles further north, in the tract of country north-west of the head of Glen Glarry. However, as we descend into the vale of Rannoch, we come upon one of those beautiful Highland views which repays us for the fatigue of our long journey from town.

There are now two hotels in Kinloch,—one is the "M'Donald Arms," and the other the "Burn Rannoch Hotel." The latter, which is the most conveniently situated for entomologists, is kept by Mrs. M'Donald, who has lived for years in Kinloch as proprietress of the former hotel, and for whom the latter was built. This good lady has long ago learned the eccentricities of the "Flycatchers," and can make them most comfortable. If we travel in a party of two or more it will be well to arrange to let her conveyance meet us at Struan, and perhaps she may board us "en pension"; but these are details which may be settled by letter. Private lodgings are most difficult to obtain in the district, and are not always quite such as the uninitiated would care for; although comfort, but of very plain character, may be found.

As it is long past noon when we have unpacked our "impedimenta," and as we have travelled something like five hundred miles since dinner last evening, we shall not care to enter very

seriously on our entomological work the first day; so we can take our nets, and a few boxes, and have a short walk, with the object of obtaining the bearings of the locality. This may be best effected by ascending the hill on the north side of the "town." If we return a little way down the road by which we entered the town we shall see to our left the village school-house, and just before reaching it is a path, which on our map is denoted by a zigzag line. This path is very steep, but for the view will be found worth the climb. It takes us to the top of "Beinn a Chuallaich," a hill of 2925 feet elevation. This, however, we must not attempt, but can bear over towards the westward, when we can at no great altitude see nearly the whole length of the great vale of Rannoch, including its Loch towards the west, and the windings of the River Tummel to the east. South-east, and immediately before us, is *the* mountain of the district, with its curiously volcanic-looking cone. This is Schiehallion, and is to be a great landmark in many future wanderings. It is given as 3547 feet high, and ranks among the higher mountains of Great Britain. It is also celebrated for certain physical observations carried out upon its summit some years ago, no less than the "weighing" of the world.

Before us, in panorama, lie the mountain's sides south of Rannoch, and on these all that most interests entomological visitors is to be found. Somewhat west of the foot of Schiehallion is the Innerhadden Burn, long one of the celebrated collecting-grounds. In this article Innerhadden will be our eastern limit, and we will carry our investigations westward as far as the head of Loch Rannoch, in all some eighteen miles of country. All the best entomological work in Rannoch has been done on the south side of the lake; and if we cast our eyes over towards the westward one of the first things we note is a white cottage near the lake-side, about a couple of miles along its shore. This used to be Duncan Campbell's; and there stayed Weaver and some of the early collectors who visited this locality. Weaver had no luxuries in those days, not even such as those of a train and post-car; for it is said that he wheeled his luggage in a barrow from Perth to Rannoch, and settled in that cottage on his first visit, when nearly everything which he caught was new. Again, to the west, we see large birch woods; these are those of Carie, where the next important burn runs into the loch,

Further on is Dall; and then the great Black Wood of Rannoch, some three miles through. There is a burn also at Dall. Past the Black Wood is Camachgouran, the chief village of the south side of the loch, and much celebrated as a good entomological locality. Here also is a burn; and near it is Cross Craig Cottage, the residence of Mrs. Robertson, of Struan, the proprietress of half the land south of the loch. Years ago this estate is said to have extended from near Glencoe to Struan, but it is now much divided. Having got all this into our mind's-eye, we may be content for the time with the promise that to-morrow we can walk the whole distance, and I can mention as we go some of the insects which we may expect to meet with, from time to time, in the various localities. In a general article of this character it is impossible to give anything like a detailed account of the riches of the various little bits of collecting-ground we shall pass on our walk from Innerhadden to the head of the loch. I will, however, try to give such particulars as may lead collectors to revisit any particular place according to the different species of insects required.

Arrived at the bridge which crosses the Innerhadden Burn we see to the left a house which used to be the residence of Duncan Stewart, who, when professionally engaged, represented the sheriff of the county, and served such legal instruments as were necessary on the surrounding inhabitants. As these duties were few and far between, he had much time on his hands, and was always willing to take in a lodger or show the visitor over the neighbouring country. As Duncan's (if he still lives there) accommodation is limited, it will be better viewed before engaged. A long day may be spent up this burn, and many mountain species observed. It bears to the west a little, through Glen Sassun, where, says a legend, there was once a great slaughter of English invaders by the highland natives. Perhaps even greater slaughter has occurred in this wild glen, for several entomologists have from time to time lodged with Duncan at its foot, notably Mr. Thos. Eedle. I never found any rare Macro-Lepidoptera in this locality which I have not taken elsewhere in the district; but among the stunted bilberry high on the mountain, at the end towards Fortingal, *Scoparia alpina* and *Penthina staintoniana* used to occur (June 16), while on the hill-top just west of Duncan Stewart's was good for *Euchromia arbutana* and *E. flammeana*.

(same date). On the tops of higher mountains south of this, and all the way west to head of the loch, if above 2000 feet, may be found *Erebia cassiope* (July 12) and *Psodos trepidaria* (July 1). I need hardly say sunshine is absolutely necessary for these to take wing, as also for *Anarta melanopa* (June 3) in same localities. This species is later than *A. cordigera*, which prefers a little lower down the hill-sides; these latter may be found at rest, when there is no sunshine, upon large stones, with an occasional *Acronycta myricæ*, and, if well looked for, a couple or three dozen a day may be taken about May 8th to 16th. Still lower on the mountain's side amongst heather we shall find in the early days of May the lovely little *Fidonia carbonaria* flitting in gleams of sunshine, frequently over the fresh fallen snow of early spring. Under the crowberry a little later are to be found the pupæ of *Pachnobia hyperborea*, once the great prize of the locality. I took my specimen on the 10th of July, but that is perhaps rather late for the imago state of this species. On the lower slope of the hills west of Innerhadden, and just above the loch, *Crymodes exulis* has been taken at sugar in July, but only odd specimens. This species also frequents certain flowers, orchids among them. It has been taken close by the road-side near the lake between Kinloch and Carie, and amongst the birch trees nearer the latter.

Keeping along the road at the foot of the hills to the westward we come to the first burn of importance, which runs into the loch from the south. This is Allt Druithe, and it is by the side of this that stands Duncan Campbell's cottage. Although small, it is a most picturesque burn, and full of interest for both entomologist and botanist; many rare and characteristic plants occur by its sides a little way up to a fine waterfall, just before reaching which is the only locality where I have taken *Larentia ruficinctata* (August 10). At the same time *Cidaria immanata* in endless variety, with other Geometers, may be disturbed from the rocks overhanging the burn; all are worth looking at, as variation seems peculiar to this locality, especially in the case of *Ypsipetes elutata*. There is a rare fern, which grows right under the fall just spoken of, viz., *Hymenophyllum wilsoni*, and *Asplenium viride* also occurs there. In passing I may mention that I have found some eighteen species of ferns in Rannoch, and many of them are rare. I have taken *E.*

cassiope just above these falls, and on up to the top of the hills above.

Continuing our walk, the road now enters a large birch wood, and this was a favourite sugaring-ground for collectors who made Kinloch their head-quarters. Most of the Noctuæ which have been recorded from Rannoch have been taken here, or further along by the loch-side. Sugar appears to be of little use before the middle of June; but July is the month best suited to it, and August is better than June. In these woods in the early spring the great prize is *Petasia nubeculosa*, which is to be found at rest. To make a good catch of this species a man needs a quick eye and great patience, for it is dreary work, frequently walking in deep snow, with a cutting wind. A little later *Endromis versicolora* is to be seen, though by no means commonly, at rest during the afternoons on the leafless twigs of the birch trees in the same locality. We now come to the Carie (pronounced Caurie) Burn, passing which the road turns somewhat past a few small houses. If lodgings could be obtained here it would save much walking, but I doubt if such could be arranged. The road now rejoins the lake-side, and continues through heathy banks on to Dall. It was on a post just as we enter the two fields before reaching the Dall Burn that Warrington found the unique *Nyssia lapponaria*; and in the field near the lake the late Mr. Blackburn found three specimens of *Sterrha sacra*, an odd find for Perthshire when we consider that South of Spain and North Africa may be considered its more natural home. Here also Weaver said he once saw a *Vanessa antiopa*. To our left is Dall House, the highland residence of Mr. Wentworth, to whom all the land belongs from Duncan Campbell's at Allt Druithe to the cottage at the west end of the Black Wood, and it is proper to obtain his leave to collect thereon.

Passing over the Dall Burn we enter the great Black Wood of Rannoch. This is probably the most important locality in Britain for students of our Lepidoptera and Coleoptera. It perhaps cannot be called virgin forest, but it is nevertheless as nearly approaching it as anything we have remaining in these islands. It is therefore probable that many of the plants and insects which occur there are direct descendants for countless ages, without suffering from the disturbance of cultivation of the land, or even forest fires. It is highly desirable that a

series of each species, no matter how common, found in such a place should be carefully preserved for comparison with those from other localities.

With the limited space at my command it would be inconvenient to give a list of all the Lepidoptera to be found in the Black Wood; but suffice it to say that, no matter what be the season of the year between April, when the sallows are well worth working, and November, when certain rare *Peronias* and other hibernating species still linger, there is always something to be discovered in this rich locality. The immense fir trees give shelter when too windy to work in more exposed places, and the rich undergrowth of heather and bilberry protect hibernating larvæ and pupæ from the very severe frosts of winter. In the height of the entomological season, on a suitable day, insects occur in such profusion that it is at times difficult to select on a first visit, what one would care most to take. Against this charm, however, we have as a set-off the bloodthirsty Diptera, which are generally left masters of the position. I have had some experience of mosquitos, but none I have met with could be more severe in their punishment than can be these large gnats of Rannoch. Among the Lepidoptera peculiar to the Black Wood are *Fidonia brunneata* (July 1), at times common enough to be a nuisance to the collector. *Mixodia palustrana* (July) also is to be found chiefly among the bilberry beds. *Sesia scoliceformis* has been found (by Mr. Cooke) on the large birches, but, although I long sought for them, I never came nearer than an empty pupa-case.

As we leave the Black Wood we enter upon Mrs. Robertson's property, and the cottage to the right by the lake-side is her keeper's house. If she will give the visitor permission to wander over her moors, as she most kindly gave to me, he will be a happy man, for on her estate occurs nearly every species which has been taken in the Rannoch district. The crofters' cottages and their "bothies" to the left form the village of Camachgouran as spelled by the natives, or Camghouran of the Ordnance maps. The moor above the village is full of entomological riches, and the higher one gets in the various ranges of hills the more varied the fauna and flora. In the meadows below the little graveyard and by the lake-side I used to take the pretty *Emmelesia blandiata* among the eyebright, and at rest on the birch

leaves in July. This species also occurs at Kinloch in similar situations. Continuing our walk, we pass the bridge over the burn which is the largest running into the lake on the south. There is much bold scenery up this burn, and good collecting. The pretty house to the right is Cross Craig Cottage, the residence of Mrs. Robertson. In the birch wood to the left, among long grass, *Erebia blandina* is often common at the end of July. The large birch trees on either side of the road which runs through the wood, although near the lake, will doubtless even now bear the marks of the entomologists' sugar, for this is the best sugaring-ground of all in Rannoch, and where one may get *Noctua sobrina*, *Aplecta occulta*, and other rarities. We must, however, pass on, and as we look over to the other side of the loch we can see the village of Killichonan facing south. Although the hills on that side look tempting enough, I never found anything to repay the time spent upon them.

We will now hurry on, for we have four miles further before reaching the loch-head. There is little new to be found on the way, for such insects as we find after passing the last birch wood are to be obtained elsewhere, and nearer our hotel. *Chortobius davus* is common on the moors here (July), and many are very fine examples; but these occur also up the Innerhadden Burn. After passing the little kirk of Finnart we see the large house at the head of the loch. This is Rannoch Lodge, the residence of Sir Robert Menzies, to whom belongs the whole north side of the lake.

We have now walked some eighteen or twenty miles, and I need hardly say feel thoroughly tired. We have not met with a single public-house of refreshment on the journey; nor are we any better off now, for there is no inn here. We may, however, persuade one of the "guid folk" in the little village to give us some tea and scones, and allow us to wait for the driver of the post-car, who will give us a lift if we have previously arranged with him, and take us back to Kinloch by the north side of the lake.

Having given intending visitors a general idea of Rannoch, I have little more now to add as regards the collecting-ground. The best, as I have said, is on the south of the loch, and extends anywhere from the lake-shore right over the mountains to Glen Lyon, as is most convenient to the collector; and, if this be his first visit to Scotland, let him take a series of every species he

meets with, for nearly all bear traces of local variation. The younger visitors must not expect to fill all their boxes every time they go out, for everything depends on weather in Rannoch. Given warm sunshine and fair wind it is not possible to set all the insects one may take, so prolific is the locality; but, on the other hand, if cold and wet, which is more frequently the case, matters are precisely the reverse. As a matter of experience I may mention that I have seen in Rannoch five weeks of continuous wet and cold, and during those weeks I have not seen as many dozen specimens of any kind of Lepidoptera. The year 1875 was a dreadful year; the whole of May, June, and part of July being more or less wet; and August almost continuously so. Should, however, the weather be propitious, no entomologist will regret a visit to Rannoch.

Savage Club, Savoy, London, June 24, 1884.

NOTES ON *BOLETOBIA FULIGINARIA*; WITH A
DESCRIPTION OF ITS LARVA.

BY W. H. TUGWELL.

A FEW weeks since my friend Mr. J. Trimmer Williams, of Foots Cray, kindly brought for my inspection six very fine specimens of *Boletobia fuliginaria*, which he was interesting himself to sell for Mr. Edward Upton, of Park Road, Bermondsey. Mr. Williams told me that he knew the history of the specimens, and that they could be depended on as genuine native London examples of this rarity. The simple fact of Mr. Williams offering them to his friends as genuine was in itself a good guarantee, and was sufficient to tempt me to obtain a pair. These I placed in my cabinet with every confidence, which opinion has since been confirmed beyond suspicion.

Mr. Williams gave me at the time a short history of them, which I will here detail. I cannot do better than quote from one of his letters to me, in which he says:—"Some few years since I was looking over some insects taken by Mr. Upton, when he called my attention to what he supposed was a variety of the common *Fidonia atomaria*, and which he kindly offered to give me; but I declined to accept it, telling him it might be of some

value, although at that time I did not know the name of the insect. I, however, exhibited the specimen (which was a very large one, and not quite perfect) at a meeting of the South London Entomological Society, when Mr. Farn at once recognised it as *Boletobia fuliginaria*. Mr. Upton was told of the rarity of his capture, and advised to keep a good look out for more."

This he has evidently done, and each year since Mr. Upton has taken an odd specimen, and in some years two or three, but generally wasted, sometimes only portions of wings found floating on water. All these specimens were taken near the River Thames. Last year Mr. Upton, after many failures, succeeded in discovering the larva feeding on fungus on rotten wood, and by dint of close search secured full-fed larvæ, and also pupæ, from which he bred some twenty specimens; and it was some of these bred examples that Mr. Williams offered to his friends.

A few weeks later I arranged with Mr. Williams to be introduced to Mr. Upton, who called upon me with him. The object of this visit was to ask me to meet them in Bermondsey, and see for myself the genuineness of Upton's discovery; the reason assigned being that doubts had been expressed in some quarters as to the specimens being truly British moths. This was a very natural doubt, without some proof, and one which I should most certainly have held, but from the fact of my relying on my friend's good faith, and that to me was above suspicion. However I agreed to meet him and Mr. Upton to be conducted to the locality, which was on May the 24th. It will readily be understood that I am not free to give the exact spot, as that would tend to deprive Mr. Upton of the fruits of his discovery.

We were conducted to an old wooden building in Bermondsey, near the river, to a spot most difficult of approach, in an obscure light, consequent on its position; and there, after a short search, Mr. Upton showed us the larva apparently feeding. In all he found four specimens. The food appeared to be a black, sooty-looking fungus or mould. The position of the larvæ, the surroundings, and the locality were such as would convince anyone, as it did me, that I had seen *B. fuliginaria* really and truly at home. But, to remove any possible doubt, if this queer-looking fungoid mass was the food of the larva, I suggested that

it would be more absolutely conclusive if I could feed the larva on this pabulum at my leisure. At once Mr. Upton broke off a portion of this fungus-covered rotten wood, and, removing one of the larvæ, gave it to me to bring home; and I have had the great satisfaction of seeing it not only eat, but thrive upon, the fungus for the past three weeks, and of showing it to several entomological friends. This, I think, establishes the genuineness of Mr. Upton's *Boletobia fuliginaria* beyond doubt.

The larvæ we saw on the 24th of May varied from about three-eighths to five-eighths of an inch long. The colour and markings, then, were very much of the same character as the now (June 14th) full-fed larva, which is about seven-eighths of an inch long, moderately stout for a Geometer larva, cylindrical in form, attenuating slightly at the anterior and posterior segments. The ground colour is of a sooty-black, the dorsal line marked by ten pairs of orange-coloured raised tubercles, two on each segment. The four central segments have also a second pair of smaller and less distinct tubercles, from the region of which spring longish and curiously recurved hairs. The spiracular line is also indicated by a row of raised orange-coloured tubercles. When full fed it spins up in the crevices of the rotten wood, and forms a fairly compact cocoon of greyish silk, the outside being coated with particles of fragments of wood and dried fungus. Three old cocoons, from which Mr. Upton had bred some of his insects last year, were handed to me, and these show most markedly the character of the wood on which grew the fungus where I saw the larva feeding in a state of nature.

I forwarded a portion of this fungus-covered wood to Dr. M. C. Cooke, who is one of our ablest authorities on British fungi, and he most kindly determined it for me as an effused Muscedine,—order Hypomycetes, family Muscedines (see 'Handbook of British Fungi,' p. 587). Dr. Cooke could not determine the genus, as it was not then in the stage of development necessary for identification.

6, Lewisham Road, Greenwich, June 14, 1884.

PS.—The larva was full fed, and duly spun up its characteristic cocoon, on June 25th.

THE GENERA *HYDROCHUS*, *OCTHEBIUS*, AND *HYDRÆNA*.

BY REV. W. W. FOWLER, M.A., F.L.S.

THESE genera of the Hydrophilidæ are, as a rule, almost entirely neglected by beginners; and even advanced students of Coleoptera seem often to have very little knowledge about them. They are best obtained by using a net shaped like a prawning-net, with a straight iron edge, with which the damp, mossy, and grassy sides of ponds and watercourses may be thoroughly scraped, and so many things obtained that are lost by using the ordinary ring-net. Many of the species, in fact most of the *Hydrænæ*, frequent running brooks and narrow watercourses. These may be captured by placing some thick frayed string across the stream, so that it rests on the surface of the water, and then stirring the stones at the bottom, and tapping and scraping the sides some little way up the stream: the insects will rise to the surface, and, as they invariably cling to the first object they meet with, will almost all be found collected on the string. In swift-running shallow streams, where there are stones and boulders projecting above the surface, or approaching near to the surface, it will be found a very good plan to place the net in the stream, just below a convenient stone, and then gently rub the sides under the water with the fingers. The beetles will then become detached, and be carried down into the net. By employing these methods Dr. Power has captured large quantities of *Hydrænæ*, &c., and has added several new species to the British list. On warm days in summer some species of *Octhebi* may be found by hundreds floating on the top of the water in stagnant pools, or basking on the mud. The insects belonging to all three genera are excessively sluggish; and, as some are very minute, it requires great patience to discover them in the net, for they will often remain perfectly motionless until the net is almost dry.

Of the genus *Hydrochus* we possess four species, which may easily be distinguished from one another:—

H. brevis, Herbst, is a short stumpy-looking insect, with the body almost ovate, and in consequence the elytra much broader than the thorax; it is of a shining black colour, and has very deeply punctured elytra. It is a very marked species, and is probably generally distributed, but is very scarce. Stephens

gives Whittlesea Mere and Norfolk as localities. Of late years it has occurred at Horning, Gumley (near Market Harborough), Perth, Dumfries, and in the North of England.

H. carinatus, Germ.—This species may best be described as a diminutive *H. elongatus*, which it very closely resembles, except that it is half the size of that insect. It was first taken in Britain in 1859, by Mr. Dossetor, at Holme Fen, Huntingdonshire; and has since been found in Wicken Fen, and other fen localities.

H. elongatus, Schall.—From the preceding insect this may be distinguished by its duller appearance and much larger size. From *H. angustatus* this and the two preceding species may be at once separated by having several of the interstices of the elytra raised into a carina or keel. Deal, Wicken and Burwell Fens, Askham Bog, and many other localities.

H. angustatus, Germ.—The interstices of the elytra of this species are not raised, so that they present a flat evenly punctured surface; the depressions on the thorax are less strong; and the whole insect has a more shining iridescent appearance. Generally distributed, but local; commoner in the South of England than in the North; London district, New Forest, &c.

Of the *Octhebi* we possess nearly half the European species. They are usually considered a difficult group, and it is certainly hard to distinguish many of them without types, as the chief distinctions lie in the impressions and furrows of the thorax; and it is hard to describe these, so that they may easily be recognised.

Some writers divide the *Octhebi* into three groups:—1st, the species that have the elytra with strong punctured striæ, comprising the first eight species of our catalogues; 2ndly, those that have the elytra with feeble punctured striæ, containing *O. æneus* and *O. æratus*; 3rdly, those that have the elytra confusedly punctured, comprising the single species *O. punctatus*. The punctuation of the first eight species, however, differs so much *inter se*, that I have found from experience that this distinction is of little practical value: *O. marinus*, for instance, is very feebly striated when compared with *O. exsculptus*, although strongly striated when compared with *O. æratus*. A better division for practical purposes might, perhaps, be made by separating off *O. exsculptus*, which used to

stand as a separate genus,—*Enicocerus*, Curtis,—and then dividing the rest according to their size, which is very constant, as a rule, in this genus. With the help of the sculpture of the thorax, the membranous border or posterior angles of the thorax, and the striation, the species may then be very easily separated.

Before, however, proceeding to deal with the species in detail, it may be convenient to point out that the sculpture of the thorax (leaving out the lateral impressions, which are comparatively unimportant) are chiefly of two kinds: first, a central furrow, with a transverse impression above it and below it, like an H laid on one side, the under line being more or less curved (T); and secondly, a central furrow, with two depressions on each side, giving the appearance of a straight line with a semicolon, more or less distinct, on each side of it ($;$ ||).

I. Second joint of the antennæ almost quadrate, but slightly narrowed at the base; membranous border hardly, if at all, visible; sculpture of thorax different in the sexes; elytra much dilated, very strongly striated.

O. exsculptus, Germ.—This species is very variable in colour, some specimens being of a dull black, others shining bronze; while occasionally specimens are met with in which either the thorax or elytra, or the base of both, are of a bright metallic blue colour. The male has the thorax very strongly convex, with a central furrow, and two impressions springing from its base, like a government broad arrow, and is comparatively smooth. The thorax of the female has a central furrow, with a semicolon on each side, and is very strongly punctured. In both sexes the thorax is strongly constricted at the base, and so heart-shaped. Specimens, however, occur in which this character is not so marked as in others. Taking these variations into consideration it is hardly to be wondered that confusion has arisen regarding this insect. The male is the *O. tristis* of Curtis, and the var. α . *viridiæneus* of Stephens; the female is the var. β . *Gibsoni* of Curtis. It appears to be found chiefly in the North of England in running streams, and is very local.

II. Second joint of the antennæ narrowed from the centre to the apex, ending in a fine point at its junction with the third joint; thorax with membranous border, or with posterior angles excised and filled with membrane, or both; elytra with sides usually more or less parallel, never very widely dilated, as in the preceding division.

A. Length $\frac{1}{2}$ a line, or thereabouts.

O. margipallens, Latr.—Thorax with very feeble central furrow, and transverse impressions above and below, which are not continued to the sides; membranous border distinct, more so at the posterior angles; elytra not very strongly, although distinctly, punctured. Legs red. A generally distributed species; found chiefly in brackish ditches; commoner in the South of England than in the North. Hanwell, Whitstable, Sheerness, Gravesend, Hunstanton, &c.

O. exaratus, Muls.—At once distinguished by its very shining appearance, deep punctuation of elytra, and by the deep sculpture of the thorax, which is very transverse, and has a feeble central furrow and two deep transverse furrows, which are continued to the lateral margins; this latter character is found in no other British species. Posterior angles of thorax excised, and filled with membrane. Legs pitchy. Usually a very rare species; but has been found in abundance by Dr. Power (who introduced it as British), and also by Mr. Champion. Rainham, Lewes, Southend, Gravesend, Whitstable. It occurs in brackish ditches, as a rule.

O. Poweri, Rye.—Thorax with central furrow and four depressions, and with posterior angles excised and filled with membrane; legs and palpi dark. Distinguished from both the preceding species by the sculpture of the thorax; and from *O. exaratus* more particularly by its duller appearance, closer punctuation, posteriorly more contracted thorax, &c. The first specimen taken by Dr. Power at Seaton, Devonshire; and several near the Chesil Bank, Weymouth, by Dr. Sharp and Mr. Crotch.

B. Length usually 1 line; never less than $\frac{3}{4}$ line.

a. Thorax with very feeble central furrow, sometimes marked by a depression, and two strong transverse impressions not continued to the sides; membranous border distinct.

O. marinus, Payk.—Thorax very finely punctured, almost smooth, often iridescent; elytra finely punctured, usually more or less castaneous; membranous border of thorax very indistinct. In general sculpture it approaches most nearly to *O. margipallens*, but may at once be distinguished by its size, colour, and wider thorax. A very common and generally distributed species in brackish ditches or stagnant pools near the sea. I have found it in great abundance at Hunstanton, Norfolk, in company with *O. bicolon* and *O. æratus*.

b. Thorax with well-marked central furrow, but no impression on the disc; membranous border distinct at posterior angles.

O. pygmæus, Fab.—Distinguished from the next species by the much stronger punctuation of its elytra, which are less dilated, and by its duller appearance; the thorax also is much more strongly punctured, and the central furrow is more marked. The commonest species of the genus. Found in fresh water (stagnant ponds and ditches) throughout the kingdom.

O. æneus, Steph.—Brassy testaceous, very shining, with elytra considerably dilated. Distinguished from the preceding by its weak striation and larger, though feebler, punctuation; and from all other species by the sculpture of its thorax. A very rare species; but has been taken by Dr. Power at Birdbrook (Essex), at Cowley (near Uxbridge), at Hanwell, and at Horsell.

c. Thorax with central furrow and two well-marked impressions (forming a semicolon) on each side; posterior angles deeply excised, and filled with white membrane.

O. bicolon, Germ.—Thorax transverse; elytra with strongly punctured striæ. Insect of an entirely dull brassy colour. Generally distributed, and common in stagnant brackish water.

O. rufimarginatus, Steph.—Allied to the preceding species, of which it is considered a variety in De Marseul and Gemminger and Von Harold's catalogues. Its short thick form and more ovate elytra, and the broadly rufous margins of its thorax, are, however, abundantly sufficient to give it specific value. My specimens are smaller than *O. bicolon*. Scarce, but generally distributed; and found both in fresh and brackish water. Repton, Birdbrook, Lee (Kent), Sheerness, Tottenham, Scarborough, &c.

O. æratus, Steph.—Distinguished from the preceding species by its dull, almost black, colour, and by its smooth elytra, which are very finely punctured, with scarcely visible striæ. It is just possible that small specimens of this species might be at first sight confounded with the largest *O. margipallens*, but the sculpture of the thorax will at once separate them. Local, and not very common; found in brackish ditches and ponds. Whitstable, Sheerness, Southend, Deal, Gravesend, Hunstanton.

C. Length, $1\frac{1}{2}$ line.

O. punctatus, Steph.—This species comes in naturally after the three preceding, which it resembles in the sculpture of the

thorax, and in having the posterior angles of the thorax excised, and filled with membrane. It is, however, abundantly distinguished from all our other species by its size, long white pubescence, and by the fact that it is the only species of the genus that has the elytra confusedly punctured. Very local. I have found it at Lymington Salterns, where Mr. Champion has also taken it; Dr. Power has found it at Worthing and Sheerness. It appears to be a southern insect.

Although the difference in size, as given, may appear to be in some cases inconsiderable, yet it will be found that in almost every case it will be possible to separate the insects out into their divisions, even without the aid of a lens. So far as my experience goes it would be almost impossible to confound them, except in the case, mentioned above, of a large *O. margipallens* and a small *O. æratus*; the former being the largest species of the first group, and the latter the smallest species of the second group. In case any difficulty should arise with abnormal specimens, a glance at the sculpture of the thorax will at once settle the matter.

The genus *Hydræna* is represented in the British list by nine species (out of twenty-two given in the European catalogues). They are chiefly distinguished by their general shape and size, and to some extent by their colour; and also by the number of rows of punctures between the suture of the elytra and the humeral angle, and by the shape of these punctures, which in some species are round, in others more or less square. The genus is distinguished from all the other Hydrophilidæ by the great length of the maxillary palpi, which are three times as long as the antennæ.

I. Each elytron with more than six rows of punctures between the suture and the humeral angle.

A. Thorax testaceous, with disc at most darker.

H. testacea, Curt.—Head black, thorax and elytra testaceous; metasternum with three raised lines, which are wanting in all the other species; thorax quite as long as broad; each elytron with eight rows of very strong punctures between the suture and the humeral angle. Length, 1 line. Local; found in both stagnant and running water. Notting Hill, Holm Bush, Epping, New Forest, Lee, Wicken Fen, Loughton, &c.

B. Thorax dark, with extreme margins only yellow.

H. palustris, Er.—Head black; thorax, except extreme margins, and elytra dark. Distinguished from the preceding by its colour, smaller size, less elongate thorax, and by the fact that each elytron has nine or ten rows of distinct, but less deep, punctures, which give the insect a smoother appearance. Length, $\frac{2}{3}$ line. Very local and rare. Askham Bog, York, and Cowley; it may always be found sparingly in the former locality.

C. Thorax entirely dark.

The three species that form this group, although very distinct from all the other species of the genus, are with difficulty separated one from another by descriptions, although their differences may easily be seen on a comparison of types.

H. riparia, Kug.—Distinguished by its size, and by having nine or ten rows of almost square punctures on each elytron; elytra broader than thorax, with sides rounded, but still somewhat parallel-sided. Length, 1 line. The commonest and most generally distributed species of the genus.

H. angustata, Sturm.—Distinguished by its parallel elytra, which are hardly at all rounded, and by having two strong longitudinal impressions on the disc of the thorax, and, above all, by the fact that each elytron has eight rows only of strong, almost square, punctures, which give the insect a more coarsely punctured general appearance. Length, $\frac{3}{4}$ line. Local and rare. The Wansbeck (Wallington, Northumberland), Falkirk, Polmont (Glasgow), &c. A north country insect.

H. nigrita, Germ.—Often confounded with *H. riparia*, which it very closely resembles, but may be separated by its smaller size, oval elytra (which are much more rounded than in either of the preceding species, and are dilated behind), and by the fact that each elytron has nine rows of almost round punctures. Length, $\frac{2}{3}$ line. Local. North of England, Scotland (Glasgow), Holm Bush, Birdbrook (Essex), &c.

II. Each elytron with at most six rows of punctures between the suture and the apical angle.

A. Punctuation of elytra very strong and regular, and plain at the apex.

a. Length, 1 line. Elytra with parallel sides, rounded at the apex only; thorax unicolorous.

H. gracilis, Germ.—A very distinct species, which may be at once known by its large size, shining pitchy appearance, and very

parallel elytra, each of which has six rows of large punctures between the suture and the shoulder. Common, and generally distributed in England and Scotland.

b. Length, $\frac{2}{3}$ line. Elytra with sides rounded and dilated behind middle, sharply truncate at apex; thorax with light margins.

H. atricapilla, Wat.—The truncate elytra are alone sufficient to separate this species at once from all others; the regular punctuation of the elytra (each of which has six rows of punctures) is also a distinguishing mark. The palpi of the male are very much thickened; at first sight it bears a superficial resemblance to *H. pygmæa*. Local. Scarborough, the Wansbeck (Northumberland), Ochil Hills (Scotland). It appears to be a northern insect.

B. Punctuation of elytra more or less feeble and irregular, especially behind the middle; thorax with light margins.

H. pygmæa, Wat.—Thorax strongly punctured; elytra with six rows of punctures on each, between the suture and the shoulder, fairly strong and regular at the base, but hard to distinguish behind the middle; thorax strongly contracted at base; elytra rounded at sides and apex. Male with femora thickened, and tibiæ dilated at base, but narrowed towards apex. Length, $\frac{2}{3}$ line. Rare. Scarborough, the Wansbeck (Northumberland).

H. pulchella, Germ.—Distinguished from the preceding by its usually smaller size, more parallel shape, lighter colour, duller appearance, and less strong punctuation of the thorax and base of elytra, each of which has six rows of rather feeble punctures between the suture and the shoulder, the outer ones being rather confused; the margins of the thorax are also more broadly testaceous, and of lighter colour than in the preceding species. Length, $\frac{5}{8}$ line. Rare. Scarborough, Derbyshire, the Wansbeck.

The *Hydrænæ* are usually found in running water. *H. palustris*, *H. riparia*, and *H. testacea*, however, and probably other species, also occur in stagnant water.

I am much indebted to Dr. Power and Mr. Champion for hints as to localities, &c., for the species.

The School House, Lincoln, June 5, 1884.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

INFLUENCE OF MILD WINTER ON LEPIDOPTERA.—The unwonted mildness of the winter and spring of 1884 has brought Lepidoptera out very early:—*Gonepteryx rhamni* was flying about before January was very far advanced; I saw *Vanessa io* the third week in February; and *Vanessa urticæ* and *Pieris rapæ* in the first and fourth weeks of March respectively; whilst *Tæniocampa instabilis* was out in the second week in February. Larvæ of *Chelonia caja* left their hiding-places in February; and I found the caterpillars of *Liparis auriflua* in the latter half of March. Mines of *Nepticula aurella* with living larvæ in were plentiful on bramble leaves throughout the winter. I found them especially abundant at Kirtling, near Newmarket, in the second week in January. I have also obtained several other species of Micro-lepidoptera, of which I will send you notes later on. The larvæ of *Grammesia trilinea*, *Cerigo cytherea*, *Leucania lithargyria*, *L. pudorina*, and the spring-feeding larvæ of the Noctuidæ generally, are more abundant than has been usual of late years; and this, I think, promises well for the coming season. I have found the above-mentioned larvæ and several others by searching among grass and low plants early in the morning. *Hybernina rupicapria*, *H. leucophearia*, and *H. progemmaria* have, as far as I have noticed, been in less abundance this winter and spring than they usually are; while, on the other hand, the early flying and hibernated Tineina have been very numerous.—A. H. WATERS; Willoughby House, Mill Road, Cambridge, April 8, 1884.

POSTPONED EMERGENCE OF LEPIDOPTERA.—Somewhere in our early periodical literature I remember to have read the statement that one of the Chelsea "aurelians," in rearing a batch of the larvæ of *Eriogaster lanestris*, was astonished to find that a third emerged the next February, another third the second February, and the remainder the February after that; and Rennie declares that this species has been known to remain in pupæ five years, which would exceed by a year the time noticed by Mr. Tutt. Apropos of another instance, given by the Rev. O. P. Cambridge, I have observed such a delay to occur in the appearance of *Cucullia verbasci*; possibly it is not infrequent throughout that very natural genus. I think it would be interesting to many entomo-

logists if Mr. Cambridge were to inform us how he distinguishes the nearly-allied *C. schropulariæ* and *C. verbasci* in larva and imago states.—J. R. S. CLIFFORD; Gravesend, Kent, June 2, 1884.

CUCULLIA SCROPHULARIÆ.—I notice that the Rev. O. P. Cambridge, in speaking of *Cucullia scrophulariæ*, says that it had not, to his knowledge, been known to remain two years in pupa. In Merrin's invaluable 'Lepidopterist's Calendar,' p. 189, we read that the species in question, as well as *C. asteris* and *C. lychnitis*, sometimes remain two years in the pupa state. As regards the latter species I can speak from actual knowledge; but I have never possessed *C. scrophulariæ* in any stage. It seems to be either an excessively rare species, or, from its great similarity to *Cucullia verbasci* and *C. lychnitis*, it may sometimes be overlooked.—ALFRED THURNALL; 120, Major Road, Stratford New Town, E., June 9, 1884.

[Cf. Entom. vi. 175.—E. A. F.]

FURTHER NOTES FROM WITHERSLACK.—On the 30th of May, although the weather was very cold and windy, I went to Witherslack; more to accompany a friend than with the intention of doing much collecting. Since I unfortunately injured one of my legs so severely I have had to go very carefully to work, and had in consequence to forbear all collecting on the mosses. I had, therefore, to content myself with less risky ground, and commenced by looking for the larvæ of *Rodophæa marmorella*, and studying its habits. I found by beating the sloe bushes a number of *Ephippiphora signatana* larvæ, but none of *R. marmorella*, until I was resting in another field, when I observed some stunted sloe bushes with locks of sheep's wool attached. I transferred my resting-place to these bushes, and having lain down beneath them soon found some tube-like galleries made—not of wool, but fine silken thread—beneath the joints of the branches. In vain I searched for eaten leaves, but could not find any trace of the scanty foliage being attacked by any insect larva. Whatever it is they do eat seems to agree with them, for they were very fat and plump. While in a warm and sheltered corner, collecting pupæ of *Crambus falsellus*, I saw *Gelechia affinella* running amongst the low herbage; also *Euclidia mi* and *Thanaos tages* flitting about. Of these latter my friend, though not an entomologist, was good enough to catch me three specimens, one

of which had a clean light brown band across the anterior wings. June 1st was windy, but in a sheltered spot behind a hedge I noticed *Pyrodes rhediana* flying briskly in the sunshine about half-past one o'clock. My friend catching them kept me hard at work boxing,—I should think quite a big hundred; with an occasional *Lycæna argiolus* and *L. alsus*. We transferred our quarters on Monday, June 2nd, to Grange, and walked leisurely over my favourite collecting-ground there, and picked up *Catoptria aspidiscana*, but worn in condition; *Æcophora flavifrontella*, *Ennychia octomaculalis*, and *Pterophorus pterodactylus* were flitting about. *Ephippiphora cirsiana* was seen amongst knapweed; *Lithocolletis dunningella* among nut-bushes. The only Geometers were *Asthena candidata*, *Acidalia remutata*, and *Iodis lactearia*. *Cemiosoma laburnella* was to be seen rising and falling like a number of charming little snow-flakes; and, as a contrast, we noted some *Micropteryx thunbergella* under a shady yew tree.—J. B. HODGKINSON; 15, Spring Bank, Preston.

NEPTICULA CENTIFOLIELLA.—Last October, whilst visiting a friend at Leyland, about six miles from here, after strolling through the orchard to see if *Nepticula minusculella* could be found, I came across a few fine large rose trees, and lost no time in finding some empty mines of a *Nepticula*. I hoped against hope for some time to find one with a living tenant; and at last one turned up. I knew the other rose-mining *Nepticula* larvæ, and therefore concluded this to be new to me; so I worked on until I found some eight or nine mines with full-fed larvæ in them, all of the same colour,—a dark brick-red. I made sure they must be *N. centifoliella*, and kept them separate. In confirmation of my opinion three specimens came out early in May. What a distinct and lovely specimen it is; the female is a really brilliant insect. I think it has only been bred before by Mr. Boyd, of Cheshunt.—J. B. HODGKINSON.

PSYCHE RETICELLA.—Two fine specimens of this local insect were captured, one on the 1st and another on the 2nd of June, on the sea-wall below Gravesend.—WM. MACHIN; 29, Carlton Road, Carlton Square, E., June 16, 1884.

PTILIUM AFFINE, *Er.*—Among some Trichopterygidæ I took in moss last winter, and which have been lately named for me by the Rev. A. Matthews, were two specimens of this rare beetle.—C. H. MORRIS; School Hill, Lewes.

BASSUS LETATORIUS BRED FROM A SYRPHUS COCOON.—On the 3rd June I bred this ichneumon from a *Syrphus* larva, obtained last October in Oreston quarry, feeding on *Aphis jacobææ*. By the end of the month it changed to pupa, and remained in that state until the above date.—G. C. BIGNELL; Stonehouse.

THE DEATH-WATCH AND ITS SOUND.—Possibly, as Mr. Macmillan suggests, what is popularly styled the “death-watch,” or tick, is produced by more than one species of beetle or larva. Some years ago I lived in a house where this sound was heard repeatedly, as coming from the panelling of one of the sitting-rooms. It was noticed by myself and others that there were variations: thus at times the taps (if taps they were) came with such regularity that they might easily have been mistaken for the actual ticking of a watch; then there were also occasional taps, with pauses,—these seemed somewhat louder, but listeners did not agree on this point. No insect was seen, in any stage of life, nor were any apertures discovered in such portions of the woodwork as were open to examination. The theory—for it can be nothing more—has been propounded these recent years that the noise is not made by the beetles as a call or signal to each other, which was the opinion of the older entomologists, but produced by the larva, in order to ascertain how near it is to the external air when it is forming mines or galleries. May it prove ultimately to be the fact that both are vocal, but in a different manner? I have never quite been able to accept another theory,—that it is by striking its head against the wood that the sound is produced by the beetle. The species credited with this ominous appellation is *Anobium striatum* or *tessellatum*; presumably a similar sound may be emitted by other species of *Anobium* under certain circumstances.—J. R. S. CLIFFORD; Gravesend, Kent, June 2, 1884.

INSECTS AFFECTING STORED RICE.—Mr. Riley, in the ‘American Naturalist,’ says:—“In a lot of damaged rice from the Chinese Centennial Exhibit, recently submitted to us by the the director of the National Museum, we found the following insects:—Numerous larvæ of *Tenebrio molitor*; larvæ of *Tenebrio obscurus*, somewhat less numerous than the former; also a few imagines of the same species; numerous larvæ, pupæ and imagines of *Murmidius ovalis*; several larvæ and imagines of *Trogosita mauritanica*; numerous dead specimens of *Calandra oryzae*; a few specimens of *Silvanus surinamensis*; a few larvæ of

Attagenus megatoma; numerous larvæ of what appears to be *Ephestia zea*; a few specimens of *Lepisma saccharina*. The larvæ of *Trogosita mauritanica* are known to prey upon other soft-bodied insects, while those of *Attagenus megatoma* live also chiefly upon dried animal matter. The remaining species found in the rice are known to feed upon stored produce, and are of no special interest, except the *Murmidius ovalis*, which is not often found in large numbers, and whose earlier states have hitherto remained unknown."

COLEOPTERA.—Having lately commenced the study of our native Coleoptera, I would be much obliged if I could communicate with some of your numerous correspondents with a view to obtaining information upon that department of Entomology, and especially in regard to good works published upon that subject.—A. HARBOTTLE; 6, Gibson Terrace, Sunderland, June 9, 1884.

[No doubt some of our friends studying the Coleoptera will be glad to obtain a correspondent in a new locality.—ED.]

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—An exhibition meeting was held on June 5th, in the new rooms of the above Society, 60 Blackman Street, Borough, at which many exhibits of considerable interest were made. The most extensive was that of Mr. T. R. Billups, comprising ten cases of Coleoptera; besides others of Hymenoptera, Hemiptera, Arachnidæ, and Orthoptera. The exhibit of Mr. Robert Adkin contained many well-set species of British Lepidoptera of considerable value, besides some full-fed larvæ of *Endromis versicolor*. Twenty-four life-histories of British species of Lepidoptera were shown by Mr. West; and a collection of leaves infested by *Coleophora*, with a collection of pupæ, by Mr. West, of Greenwich. A case of Lycænidæ, by Mr. J. T. Hall, and five cases of exotic Lepidoptera, by Mr. Bliss, formed very effective exhibits. A case of Neuroptera and Trichoptera was shown by Mr. Vincent; and another case was on view showing the manner of setting Lepidoptera without pins through the thorax, as advocated by Mr. G. Coverdale. The life-history of the celery fly was also shown; and that indefatigable collector Mr. G. Elisha showed some cases of Tineæ. A large number of microscopes, showing various wonders of insect-life, with extensive mural decorations, composed chiefly of drawings of botanical specimens, helped to form a very interesting exhibition of work done by the members.—WALTER A. PEARCE, Hon. Sec.

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NOTES ON A NEW ZEALAND APHIS.

BY GEORGE VERNON HUDSON.

IN the following paper I have endeavoured to give a brief account of a colony of Aphides, and their dependents direct and indirect. The investigation of these communities of insects has afforded much pleasure, showing as it does the wonderful means Nature employs to keep the numbers of individuals of various species in proper check.

I have been at present unable to discover the name of the Aphis here, owing to the want of both catalogues and collections of this order; but, as no doubt such a common species has been described, it must suffice at present to state that it is the common Aphis of the country, and is found almost everywhere.

The females, as in the British species, being apterous, are about a line in length, and covered with a kind of waxy secretion. The male is considerably smaller, and has ample wings; but its chief peculiarity consists in the great length of its hind legs, which are nearly three times as long as the body. Colour dull grass-green in both sexes. These insects are very destructive, multiplying with great rapidity viviparously. They first appear about the end of November, and increase till the middle of January, when they continue in great numbers for about ten weeks, the colder weather, which generally sets in at the beginning of April, rapidly causing them to disappear.

The injuries produced by Aphides on many cultivated plants is well known, and holds good with increased force here, as they

seem to have almost forsaken the native vegetation in favour of cabbages, broccoli, and many other garden productions.

Fortunately, there are several insects which accompany the Aphis in its migrations, and destroy it in immense numbers, a small brown ichneumon (probably an *Aphidius*) being the most serviceable in this respect. These little insects may be found abundantly wherever Aphides occur; and it is not infrequent to see them on window-panes indoors. The female deposits an egg in the Aphis by means of a long ovipositor with which she is furnished. From this a minute grub proceeds, which devours the internal portions of the Aphis, reducing it at last to an oval shell, fixed firmly to a leaf, by its edges. When in this condition the Aphis is of course quite dead, and the ichneumon is probably in the pupa state, as the emergence of the perfect insect takes place in a few days. Numbers of these exuviae may be found in most of the communities, and I have frequently seen large ones nearly exterminated by this insect alone.

The larvæ of the genus *Syrphus*, among the Diptera, are well known to be great Aphis consumers; and as these insects are here very abundant it is not surprising to find the larvæ plentiful in the Aphis colonies. The species which I have noticed most commonly is *Syrphus ortas*, but I expect the others have a very similar economy. The larva of this insect when full grown measures about 5 lines in length; its surface is so much wrinkled that the divisions of the various segments are not distinguishable; the abdomen and sides are dark green, the back being of a yellowish brown colour, which is caused by the presence of a large quantity of fatty substance situated just beneath the thin skin of the insect. In the middle of this yellowish portion is a broad dark green line, extending from within a short distance of each end of the larva. This is the dorsal vessel, and by careful examination its pulsations may be distinctly detected. Near the anal extremity, on the dorsal surface of the larva, is a short thick tube, which has at its apex what appear to be four lunate spiracular holes. I could not detect the opening and closing of these, although I watched carefully, so cannot be quite certain as to their function. The anal aperture lays exactly opposite this tube on the ventral surface of the body. These larvæ grow very slowly, probably occupying several weeks to attain full growth. They eat large quantities of Aphides, which they have a very peculiar method of procuring,

briefly as follows:—The larva, by lying in the midst of Aphides, necessarily causes some of them to crawl over it, and on feeling them touch its back it immediately darts out its long pointed head and strikes an Aphis with the end, which is enveloped in a quantity of very sticky mucous, constantly ejected from the mouth. On the Aphis being thus captured the larva withdraws its head into the hinder segments, and devours all the juicy portions of the Aphis, the dry skin being afterwards thrown aside. In its method of progression this larva resembles a small slug, possessing no legs of any description. When full grown it slowly shrinks up and changes into a curious-shaped coarctate pupa, somewhat resembling a pear, with the stalk proceeding out sideways some little distance from the thinner end. This appendage is the air-tube, bearing spiracles at its extremity. The pupa is not protected by any kind of cocoon, but simply lays amongst the refuse near the stem of the plant which the Aphides had affected. In a fortnight or three weeks the fly emerges. It is very common everywhere, and is fond of hovering over and sucking honey from the flowers. Occasionally specimens may be seen running about plants, probably in search of a suitable place to oviposit.

One other species will complete our Aphis dependents, and that is a small hymenopterous insect of a black colour; the abdomen red in the middle; and the legs striped with black, white, and orange. Length, $2\frac{1}{2}$ lines. This insect has been described by Smith in the 'Transactions of the Entomological Society,' 1878, p. 3, under the name of *Scolobates varipes*. It is parasitic in the *Syrphus* larva; and being very common in some places must destroy a considerable number of them. It entirely eats the soft portion of the insect, being found in the pupa state lying snugly within the hard old shell of the *Syrphus* pupa, which forms a good protective cocoon for it. The ichneumon emerges in a few days, and may be found in the vicinity of Aphis colonies, evidently searching for victims.

The larva of *Coccinella tasmanii* no doubt feeds on Aphides, but it is far from being common; and as I have as yet only found the pupa, this insect must at present terminate our list.

Karori, Wellington, New Zealand, April 26, 1884.

CAPTURES OF COLEOPTERA.

BY G. A. LEWCOCK.

NOTICING your correspondent's request, in the last number of the 'Entomologist,' for information concerning our native Coleoptera, it occurred to me that a few observations on this subject might be acceptable, and perhaps have the effect of awakening some of our slumbering coleopterists, and stimulate them to record their captures from time to time in this magazine. I have pursued the study of this branch of Entomology for some years, and have often found great difficulty in obtaining precise information as to the habits, time of appearance, &c., of the various species; for want of which information my researches have been conducted in a somewhat haphazard fashion, though, by continual observation and making extensive notes, I have succeeded tolerably well.

When first I resolved to take up Coleoptera, I obtained a copy of Rye's 'Beetles,' from the library of the Haggerston Entomological Society; this gave me several useful hints as to localities, &c., and proved to be a valuable book indeed. I next turned my attention to Cox's 'Handbook of British Coleoptera,' a work which is indispensable to the coleopterist, as giving descriptions of the British species. I was unable for some little time to make much headway in naming, but in this matter I obtained much valuable assistance from others similarly occupied. With the more difficult species, however, the Rev. W. W. Fowler most readily aided me; and moreover, in returning the named specimens, he very kindly filled up my box with a quantity of types of other beetles, many of them uncommon and some rare, which I found of great service. This gentleman frequently contributes articles to the 'Entomologist' (see vol. xvi., also July number, 1884), and from them I have derived considerable information. However much one reads on this subject, there is nothing like personal experience, which can only be acquired by diligence and perseverance. At the same time, should the practice of recording become general, it would materially assist us to obtain a better knowledge of the habits of our British Coleoptera than is at present available for the young aspirants in the study of this

order of insects. I will now proceed to narrate some of my experiences in search of Coleoptera this season, premising however, that I have generally been accompanied by a friend, Mr. J. Cripps, who also is interested in this branch of Entomology.

April 5th. Having determined to work up the Silphidæ, Mr. Cripps took a preliminary trip to Esher for the purpose of putting down the baits—some bottles containing pieces of liver; and he also carried a dead rat with him.

April 14th. Departed from Waterloo Station in the early morning, a cold easterly wind prevailing. Arrived on the ground in due course, we commenced sweeping, with but little result, so tried beating the furze-blossom, and obtained *Apion ulicis* and *A. striatum* in profusion; also several *Sitones linearis* and other common beetles. *Helops striatus* abounded at the foot of fir trees. Also took one specimen of each of the following:—*Dromius meridionalis*, *Coccinella 18-guttata* and *C. hieroglyphica*. *Strophosomus limbatus*, *S. coryli*, and *Adimonia suturalis* were obtained by sweeping heath. Swept a few *Plectroscelis subcærulea*. Visited the baits, finding three *Necrophorus humator*, several *Choleva chrysomeloides* and other *Cholevina*.

May 10th. Weather much improved, insects consequently abundant; *Cicindela campestris* and *C. sylvatica*, flying briskly in the hot sunshine or darting at lightning speed along the heath, were oftener seen than caught; in fact I took but one *C. sylvatica*. Netted a *Silpha thoracica*, flying at full speed in same place. By general sweeping obtained *Apion genistæ*, *A. ulicis*, and *A. striatum*; also *Cytilus varius*, *Phyllobius pyri*, &c. *Aphodius depressus*, *A. prodromus*, and *A. hæmorrhoidalis* I procured from their usual habitats. *Timarcha coriaria*, *Byrrhus fasciatus*, and many common species from sandpits; and several common *Cissidæ* on the wing late in the evening. The baits were not forgotten, and on examination yielded eight *Silpha thoracica*, one *S. rugosa*, several *Necrophorus humator*, *N. mortuorum*, *N. vespillo*, *Hister cadaverinus*, and several *Cholevina*. Result of day's work very gratifying.

May 16th. By way of change went to Loughton. Sweeping was rather difficult, the herbage being sparse and scanty; nevertheless bagged several *Apion genistæ* from the yellow-flowering plant *Genista anglica*. Also several *Crepidodera rufipes*. Beating

was a more successful affair ; obtained *Adimonia sanguinea*, *Rhynchites nanus*, *Orchestes fagi* (commonly), *Telephorus pallidus*, *T. limbatus*, *Phyllotreta nemorum*, *Coccinella variabilis*, *Dolopius marginatus*, *Phyllobius argentatus*, *P. uniformis*, and *Polydrosus cervinus* (the latter three were very common). It may be as well to mention that the foregoing were all beaten from horn-beam, the hawthorn being scarcely advanced enough to prove sufficiently attractive to insects.

Respecting the locality of Loughton I cannot say that I hold a very high opinion of its merits, either for Lepidoptera or Coleoptera. Of course there are specialities to be obtained there, but these are few and far between. On various occasions I have received from Messrs. Boden, J. A. Clarke, T. Hockett, W. Harper, and other members of the Haggerston Entomological Society, specimens of *Liopus nebulosus*, *Clytus mysticus*, *Melandrya caraboides*, *Toxotus meridianus*, *Bembidium quadrimaculatum*, &c. I have also obtained several species of *Aphodii*, but taken as a whole the Forest does not yield enough to repay one for the trouble of working it.

May 24th. Resumed at favourite locality—Esher. Weather scorching. Having taken a specimen or two of *Donacia bidens* here last year, resolved to lose no opportunity of working at the *Donaciæ* generally this season. Commenced sweeping the low rushes and herbage in marshy places near ponds, and succeeded in getting *D. linearis* and *D. sericea*, commonly ; also specimens of *D. typhæ* and *D. dentipes*. *Eirirrhinus nereis* occurred commonly ; also took *Micraspis 12-punctata*, *Coccidula rufa*, *Phyllobius pyri*, *Telephorus pallidus* (very common), *Phratora vitellinæ* (common). Captured one specimen of *Mycetophagus atomarius*, which settled on my coat. Bagged *Ips ferrugineus*, flying lazily across the new line at Cleygate. Was much puzzled by an insect I obtained by sweeping, taking it for a dried *Coccinella hieroglyphica*. Referred it to a friend, of the South London Entomological Society, who informed me that it was *Hyperaspis reppensis*, a rare beetle, occurring in moss on chalky hillsides, under stones, and decaying seaweed on the coast, &c., found also by sweeping under fir trees ; it had been taken at Sheerness, Box Hill, Chobham, Esher, Mickleham and Shirley.

June 2nd. Went to Farnham alone. Weather fine and very

hot. Hawthorn blossom magnificent; commenced operations on it early in the morning; soon obtained *Grammoptera ruficornis*, *Attagenus pellio* (very unusual to find this on hawthorn!), *Adimonia sanguinea*, *Rhynchites æquatus*, *Helodes lividus* (2), *H. minutus* (common), &c. Later on I swept the rushes at Cannon pond; obtained *Donacia linearis* and *D. semicuprea*. By the courtesy of Mr. J. R. Nash I explored some hop-gardens, and obtained several specimens of *Pachyta collaris*. This insect, which I am told bores in the hop-poles, I have hunted for unsuccessfully for several years; it flies very rapidly in the hot sunshine, but most of those I captured were beaten from the hawthorn, and swept from the nettles growing in a ditch in centre of the ground. I also took a couple from hawthorn in Darvill's meadows, but the water being over my shoe-tops I was reluctantly compelled to desist. Tried an osier-bed, and obtained a specimen of *Cryptorhynchus lapathi*; also *Nitidula bipustulata* and *Epuræa obsoleta*. Beat six *Luperus rufipes* from oak at Crooksbury Hill; also *Rhynchites nanus*, *Telephorus hæmorrhoidalis*, &c. From broom I obtained several *Goniocтена litura*, *Bruchus cisti*, *Sitones regensteinensis*, &c. The locality of Farnham well repays the trouble of working.

June 21st. Locality Esher. *Luperus betulinus* very common by beating almost any foliage. This species, as well as others of same genus, should be carded as soon as possible, otherwise they go to pieces in the laurel. Obtained *Clytus arietis* and *Dorytomus pectoralis* from willow; *Coccinella oblongo-guttata* and *C. ocellata* from fir; and *C. 16-guttata* and *C. 14-guttata* by general sweeping; as also a few *Scirtes hemisphæricus*. Took several *Donacia linearis*, *D. sericea*, also *D. menyanthidis*. The latter beetle, which Mr. Cripps first found on June 2nd this year, requires looking for in the curled blades of previous year's growth, of dried reeds standing in quagmires. Those who want it must not be afraid of the water or quagmire either. I can only say that Mr. Cripps and myself tucked up our trousers, waded in, and got a series each from the reeds. Found *Anchomenus gracilis* running quickly in and out of the rushes growing by waterside; also one *Elaphrus cupreus*. Baits again produced *Necrophori* and *Cholevina*.

July 5th. Went alone to Surbiton by 8.5 a.m. train. Took a tour round Hook, Cleygate, Claremont and Esher, finally

walking into Kingston at 9.45 p.m. I did a hard day's work and was quite tired out. At the commencement I swept *Coccinella 11-punctata* and *C. 22-punctata*; obtained a couple of *Mantura rustica* from clover; *Cassida viridis* from thistles; *Lagria hirta*, generally common in hedges; *Anthrenus claviger* from cow-parsley. Took twenty *Malachius ruficollis* in a space of about ten yards. This insect seems very local; it occurs at Farnham on the banks of the Wey, and also at Guildford, where Dr. Capron has taken it. *Anthocomus fasciatus*, of which I captured two specimens, is generally distributed at Esher, but is not common; it occurs on the small herbage growing by ditch sides; also in buttercup flowers, and prefers the shady side of the hedge. Of *Pyrochroa serraticornis* I generally take one a year; captured the one for this season to-day. *Gastrophysa polygoni* occurred sparingly, also *Phædon cochleariæ*. *Gymnetron pascuorum* common in a recently-mown meadow; took one *Cryptohypnus quadripustulatus* at same place. Beat *Agrilus angustulus* from hazel; tried for more, but rain descended and interrupted my proceedings. These I continued again afterwards, but I got only *Chrysomela didymata* and a few *Donacia sericea*. Removed some *Necrophori* and *Cholevina* from baits, and this finished my labour for the day.

July 7th. Had a couple of hours at Coombe, taking *Attelabus curculionoides*, *Dolopius marginatus*, and three species of *Orchestes* from oak; *Rhynchites betulæ*, *Athous niger*, *Cryptcephalus labiatus*, *Lema melanopa*, &c., from miscellaneous foliage; also *Bembidium quadrimaculatum* and *B. quadriguttatum* from a dried-up pond.

This concludes the account of my captures up to present date. I hope some other coleopterist will shortly give his experience.

40, Oxford Road, Islington, N., July 12.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*).

HENICOSPILUS, *Steph.*

Almost entirely testaceous (male and female).

A. Fore wing with two horny spots in first cubital cell.

a. Thorax almost entirely black; apex of abdomen black.

3. *combustus*, 9 lines.

b. Thorax testaceous.

- * Apex of abdomen infuscated at sides. - 1. *merdarius*, 6—10 lines.
 ** Apex of abdomen black. - - - 2. *ramidulus*, 6—10 lines.
 B. Fore wing with one horny spot. - - 4. *repentinus*, about 6 lines.

Stephens' genus *Henicospilus* is only distinct from *Ophion* in having one or two chitinous spots in the fore wings. This is a very unstable character, and not of generic value, although included as only a convenient division of the species of *Ophion* by Holmgren, Taschenberg, and other continental authors. In *Ophion inflexus*, Ratz., the spot is almost absent, and asymmetrical (see Die Ichn., i. 102, iii. 80; and Vollenhoven's 'Pinacographia,' pl. 39, fig. 4). There is a good coloured figure of *O. combustus*, and details of wing-spots, in Stephens' Illustrations (vol. vii., pl. xl., fig. 4); Taschenberg did not know this species (Zeits. Ges. Nat. xvi. 436), but it is not rare in Britain. Ratzeburg figures *O. merdarius* (Die. Ichn., vol. i., pl. vi., fig. 8), and Donovan figures *O. ramidulus* (pl. 42, i.). Details of *O. merdarius*, *O. ramidulus*, and *O. repentinus* are beautifully figured in 'Pinacographia' (pl. 28, figs. 5, 5 a, 6, 6 a; pl. 39, fig. 6, 6 a). With the exception of *O. repentinus*, Holmgr., the British species are not rare. Ratzeburg describes the cocoon of *O. merdarius* as resembling a large *Lophyrus* cocoon, dark brown in colour, with the central third paler. The cocoon of *O. ramidulus* is figured on Plate ii., fig. 9: it is a hard cylindrical dark brown cocoon, with a thin covering of loose black silk; 6 lines long by $2\frac{1}{4}$. One of Ratzeburg's pupils probably mistook the cocoon of *O. merdarius* for that of *Lophyrus pini*, from which he bred the *Ophion* in April, 1843 (Die Ichn., i. 102).

Two species have been bred from the following hosts:—

1. *merdarius*, Gr., from *Trachea piniperda*; Ratzeburg. *Dianthœcia irregularis* (echii); Brischke. *Hecatera dysodea*; (Perris) Giraud. *Cucullia argentea**; Brischke. *Grammodes algira**, *Pseudophia tirrhœa**; Kriechbaumer. ?*Samia cecropia**; Taschenberg.
2. *ramidulus*, L., from *Pecilocampa populi*; Rondani. *Eriogaster lanestris*; Scopoli. *Dipterygia pinastri*; Drewsen. *Trachea piniperda*; Hartig, Giraud, Brischke, Norgate. *Dianthœcia capsicola*; Giraud. *Hadena pisi*; Gravenhorst, Giraud, Bignell.

OPHION, *Fabr.*

Almost entirely testaceous.

A. Thorax black-marked (male and female).

a. Base and apex of abdomen black; sutures of thorax black.

5. *marginatus*, 7—10 lines.

b. Extreme base of abdomen not black; back and apex of abdomen more or less black.

* Antennæ red. - - - 4. *ventricosus*, $4\frac{1}{2}$ — $7\frac{1}{2}$ lines.

** Antennæ black at the base. - - - 6. *bombycivorus*, 9—10 lines.

B. Thorax not black-marked (male and female).

a. Radial nervure of front wing wavy. - 3. *undulatus*, 9—14 lines.

b. Radial nervure straight.

* Lines on thorax and scutellum yellow.

† External and internal nervures of prædisoidal cell (pl. i., figs. 2, 10) of equal length. - - - *minutus*, $4\frac{1}{2}$ — $5\frac{1}{2}$ lines.

†† External nervure of prædisoidal cell one-third shorter than internal nervure. - - - 1. *obscurus*, 4—10 lines.

** Marks on thorax sometimes pale, not yellow. - 2. *luteus*, 4—9 lines.

This well-marked genus is the type of the family, and contains two or three of our best-known Ichneumons, which are generally common from early spring to late autumn. Their habit of coming to light has already been noticed. The neuriation is remarkable, but it is very inconstant in its minor details in the same species: the upwards of 60-jointed antennæ is noteworthy (in *O. undulatus* the male has 66, the female 63; *O. merdarius*, male, has 68; and *O. ramidulus*, male, 70); and Curtis remarks on the difficulty of separating the sexes, and notes that frequently only one sex of *Ophion* (as in many other genera) "is bred from an infested larva, although a considerable number may be hatched." *O. minutus*, Kriechb., is added to the six species included as British in Marshall's catalogue (see Entom. xiii. 54, and Trans. Ent. Soc. Lond., 1881, p. 157). It is not uncommon, and doubtless was formerly overlooked as a small variety of the common *O. obscurus*. Vollenhoven gives beautifully coloured figures of *O. obscurus*, *minutus*, *luteus*, *undulatus*, and *ventricosus* on plates 28 and 39 of 'Pinacographia;' and Jurine gives a fair coloured figure of *O. marginatus* in his 'Nouvelle Méthode,' pl. 8, fig. 4. *O. ventricosus* is figured on Curtis's plate, 600. In addition to Gravenhorst and Holmgren, reference should be made to Taschenberg's "Zur Kenntniss der Gattung Ophion Fab." (Zeits. Ges. Nat., vol. xlvii., pp. 421—438). The species are all parasitic on Macro-Lepidoptera, and

the parasitic larva leaves its host when full-fed and spins its own cocoon, either within the cocoon of its victim—when this is a cocoon-making species—or by the side of the dead larva skin, or pupa, as is more frequent. *O. luteus* occasionally spins its cocoon within the pupa of its host. Mr. Bignell has confirmed Gravenhorst's observation in the case of *Agrotis præcox* pupa (cf. Ichn. Europ., iii. 693). Réaumur figured (ii. p. 435; pl. 35 and 37) the banded gold-beater's-skin-like cocoons, and minutely describes the process of formation. The similar cocoon of *O. pteridis*, Kriechb., ex the European Noctua—*Eriopus pteridis*, Fabr., is figured in 'Pinacographia,' pl. 39, fig. 5 b. The more common form of cocoon of *O. obscurum* is figured on Plate ii., fig. 8: it is smooth, hard, cylindrical, 9 lines by 4, dark testaceous, with a few threads of black silk running over the surface. The irregularly cylindrical, shining chestnut-brown cocoon of *O. bombycivorus* ex *Stauropus fagi*, from the New Forest, is figured at Plate ii., fig. 10: the outer envelope appears to project out of the cylindrical shape of the inner one; it measures 8 lines by 5; there are but a very few silky hairs on the cocoon. Vollenhoven describes the cocoon of *O. minutus* as obscure brown with a gray band, but not metallic in colouring. The following species have been bred; the common *O. luteus* and *O. obscurus* from many varied hosts; while the fine and rare *O. undulatus* and others appear to be almost confined to the larger Bombyces:—

1. *obscurus*, Fabr., from *Arge galathea*; Raynor. *Sesia formicæformis*; Brischke. *Bombyx pini**; (Reissig) Ratzeburg. *Dicranura vinula*; Eedle. *Pseudopterpna cytisaria*; Brischke. Geometrid; (Reissig) Ratz. *Acronycta leporina*; Drewsen and Boie. *Pachetra leucophæa*; (Graff) Ratz. *Agrotis porphyrea*; Brischke. *Hadena protea*, *Epunda lichenea*; Bignell.
2. *luteus*, L., from *Sesia formicæformis*; Brischke. *Chelonia villica*; DeGeer. *Bombyx pini**; (Reissig) Ratz. *B. quercus*; Marshall Coll. *Demas coryli*; Brischke. *Dicranura bifida*; Brischke. *D. vinula*; DeGeer, Grav., Curtis, &c. *Cymatophora flavicornis*, *Acronycta aceris*; Brischke. *A. leporina*; Bignell. *Leucania lithargyria*; Butler. *Dipterygia pinastri*; Drewsen and Boie. *Agrotis præcox*; Grav., Bignell. *Trachea piniperda*; (Graff, Schmidt) Ratz. *Tæniocampa populeti*; Bignell. T.

- munda; (Goossens) Gir. *Dianthœcia capsicola*; Marshall. *D. cucubali*; Drewsen and Boie, Marshall. *Miselia oxyacanthæ*; Bignell. *Hadena pisi*; Marsh. *Cucullia verbasci*; Gir. *C. scrophulariæ*; Brischke. *C. absynthii*; Müller, Brischke. *C. chamomillæ*, *C. artemisiæ**; Gir., Brischke. *C. argentea**, *C. thapsiphaga**, *C. mixta**; Brischke.
3. *undulatus*, Gr., from *Bombyx trifolii*; (Hartlieb) Grav., Curtis, Holmgren, Gir. *B. rubi*, *B. quercus*, *B. catax**; (Perris) Gir. *B. quercus* var. *Spartii*; Bellier de la Chavignerie. *Samia cecropia**, (Brinckmann) Taschenberg, large *Bombyx*; Rudow. ?? [Two from one pupa of *Tæniocampa gothica*; Harrach.]
4. *ventricosus*, Gr., from *Callimorpha dominula*; Gir. *Bombyx quercus*; Marshall.
6. *bombycivorus*, Gr., from *Stauropus fagi*; Grav., (Standish) Desvignes, Brischke, Norgate.
- minutus*, Kriechb., from *Tæniocampa cruda*, *Pionea forficalis*; Vollenhoven.

NOTOTRACHYS, Marshall.

Head and thorax black, variegated with red; legs black, variegated with red and straw-colour (male and female). - 1. *foliator*, 3—5½ lines.

This interesting species, which connects the *Ophions* with the *Anomalons*, being nearer to the latter, is included by Marshall as doubtfully British. There are three females from Desvignes' collection in the British Museum, but we know of no recent capture. It should occur with us, as the species is generally distributed; see Gravenhorst's localities; and Holmgren says it is not rare in Sweden. It is recorded from Halle by Fabricius and Taschenberg, from Holland by Vollenhoven, from Piedmont by Giraud, from France by Dours, from near Vienna by Kirchner, from Parma by Rondani, and from St. Petersburg by Woldstedt; we have German specimens from Kaltenbach's collection, Corsican specimens captured by the Rev. T. A. Marshall, and Albanian ones by Sir Sidney Saunders. *N. foliator* is figured in Vollenhoven's 'Schetsen,' pt. i., pl. ii., fig. 23; and has been bred from *Hymenorus doublieri*, one of the *Cistelidæ*, by Perris, according to Giraud.

SCHIZOLOMA, Wesm.

The general colour of this and the following genera to *Trichomma* (except *Gravenhorstia*, which is black variegated with yellow) is much alike.

Head and thorax black, more or less marked with red or yellow; legs and abdomen reddish yellow, more or less marked with black.

Scutellum black (male and female). - - - 1. *amicta*, 8—13 lines.

Wesmael, in his "Revue des Anomalons de Belgique" (Bull. Ac. Brux., vol. xvi., pt. 2, pp. 115—139), subdivided Gravenhorst's very natural genus *Anomalon* into five subgenera:—*Schizoloma*, *Heteropelma*, *Exochilum*, *Anomalon*, and *Trichomma*. These are adopted in Holmgren's classical 'Monographia Ophionidum Sueciæ,' and in Marshall's Catalogue; but Vollenhoven has lately written, "in our opinion Wesmael's subgenera... have no claim to be retained as genera" (Pinacog., p. 6). Taschenberg merely adopts them as subgenera (Hym. Deutschl., p. 71). The single species of the genus is not uncommon in Britain. The male is well figured by Curtis (Brit. Ent., pl. 736); and a small female, with details, by Vollenhoven (Pinacog., pl. 3, figs. 5—5 c). Several of Ratzeburg's species, bred from *Sphinx pinastri*, and Desvignes' *A. capitatum*, probably belong to this genus, if they are distinct from *S. amicta*. The larva of this species makes a very thin cocoon, and emerges direct from the pupa of its host. It is solitary in its parasitism, and has been bred as follows:—

Callimorpha dominula; Buchecker Coll. Orgyia pudibunda; Brischke. Demas coryli?; Marshall Coll. Bombyx rubi; (Speyer) Ratzeburg. Cnethocampa processionea; (Richter) Gravenhorst, (Baer) Ratz. Pygæra bucephala; (Reissig) Ratz. Eupithecia linariata; Bignell. Xylina rhizolitha; (Perris) Giraud. Cucullia sp.?; (Bond) B. M. Coll. Halias prasinana; Brischke.

EXOCHILUM, Wesm.

Scutellum yellow, rarely black (male and female).

1. *circumflexum*, 8—10 lines.

This genus also contains but one species, the fine and not uncommon *E. circumflexum*. Its female is figured by Holmgren in the Swedish "Öfversigt" (vol. xiv., pl. ii., fig. 2); and characteristic details are given in 'Pinacographia,' pl. 3, figs. 6, 6 a. See also Ratzeburg's figures, 'Die Ichn.,' vol. i., pl. vi., fig. 2; and 'Die Waldverderber,' pl. i., fig. 6; and Donovan, pl. 93, 2. Ratzeburg traces and figures the details of this species from the egg in his 'Die Ichneumonien,' vol. i., pp. 80—87; pl. ix., figs. 11—22; and 'Die Waldverderber,' pl. i., fig. 6 L, pl. iii., fig. S''. This should be consulted as a typical life-history of the

Anomalous, or the abstract in the Ray Society's Report on Zoology for 1844, p. 363; the curious tailed young larva and the absence of tracheæ, the probability of a double brood, the departure from the normal solitary parasitism in two instances out of over fifty, and many other points raised, are of great interest. The parasite emerges direct from the pupa of its host, constructing a very delicate cocoon within. Ratzeburg, Brischke, and Harrach bred it from *Lasiocampa pini**, Brischke from *Euplexia lucipara*; and Hartlieb (teste Gravenhorst) and Ratzeburg bred the var. *giganteum* from *Bombyx trifolii*.

HETEROPELMA, Wesm.

Scutellum black (male and female). - - 1. *calicator*, 5—7 lines.

Wesmael's rare *H. calicator*, again the only species in the genus, was confounded by Gravenhorst with *A. xanthopus*. Kawall bred it from *Fidonia pinaria* and Brischke from *Trachea piniperda* and *Halias prasinana*.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ARGYNNIS LATHONIA NEAR SALISBURY. — While strolling through a clover-field near here, last August, I captured a pair of *Argynnis lathonia*.—G. H. PENRUDDOCKE; South Newton Vicarage, near Salisbury, June, 1884.

APATURA IRIS NEAR SALISBURY.—My brother caught a female specimen of *Apatura iris* on the lawn of this vicarage last season. This is the fourth specimen I have heard of being captured in this neighbourhood.—G. H. PENRUDDOCKE.

MELITÆA ARTEMIS IN SHROPSHIRE.—I have much pleasure in recording the occurrence of this very local species in this district. While taking an evening stroll at Church Stretton on June 12th last, and not in the least expecting to see any butterflies so late in the day,—5.45 p.m.,—I was all the more surprised to meet with *M. artemis*, never having before found it in this county. I easily caught one with my fingers, having no net with me, and found it in fair condition. Several others were noticed during the next half-hour flying in company with *Argynnis euphrosyne*, which was quite freshly emerged and on the wing in some numbers up till

6.35, an unusually late hour, but accounted for by the very bright evening and great heat of the sun.—MARTIN J. HARDING; Cottisbrooke, Shrewsbury, July 4, 1884.

VANESSIDÆ IN SUMMER.—On June 28th I noticed, at Weston-super-Mare, a perfect specimen in fine condition of *Vanessa atalanta*, and also, here, single perfect specimens on July 4th and 5th. Each season for the last two years I have noticed single specimens in June, which I think cannot have been hibernated ones. On the 5th I saw several specimens of *Vanessa cardui* in perfect condition amongst other worn and tattered ones. Hibernated specimens of *V. cardui* were extremely abundant in May, in Dorsetshire. Perhaps other lepidopterists have made similar observations in other localities this season. When in Kansas, U.S., some few years since, I noticed that *Vanessa atalanta* was most abundant in the spring: I rarely saw them in the autumn.—T. B. JEFFERYS; Tynningfield, Clevedon, July 7, 1884.

DEIOPEIA PULCHELLA.—About three years ago I was fortunate enough to obtain a specimen of the above. I took it (fluttering upon a heap of sand) at Westbourne, Bournemouth, Hants.—EDWARD LEWER GUTCH; Christchurch, June 18, 1884.

REARING OF BOLETOBIA FULIGINARIA.—I was much gratified by finding, on July 14th, that an imago had emerged from the pupa mentioned in the 'Entomologist' (vol. xvii., p. 153) last month. The insect is a perfect female, and is a trifle smaller than those bred by Mr. Upton from pupæ collected in their native habitat. This was doubtless caused by the difficulty I experienced in retaining a uniform balance of moisture in growing the fungus upon which the larva fed for three weeks after I obtained it. The life-history of *Boletobia fuliginaria* appears to be summed up as follows:—Ova deposited end of July or beginning of August; larvæ hatch in August, and after hibernation continue feeding until the end of June of following year, when the pupa state lasts about three weeks, and the perfect insects appear about the middle of July. — W. H. TUGWELL; Greenwich, July 20, 1884.

CUCULLIA SCROPHULARIÆ AND VERBASCI LARVÆ. — In reply to Mr. Clifford's note in the last month's 'Entomologist,' some time since I visited our lamented friend, Mr. Buckler, and saw his drawings of the above-mentioned larvæ; they are certainly at the

first glance very much alike, but my friend impressed upon my memory the difference between the two in these words:—"The commonest (*verbasci*) has a saddle and stirrups, the other is without stirrups," alluding to the yellow markings on the larvæ. It is well known that *verbasci* feeds upon *Scrophularia*; in fact, in this locality, where I find one on *Verbascum* I find twenty on the former plant; *verbasci* larva has a patch of yellow on the back and sides, and *Scrophulariæ* on the back only; the moths are very different.—G. C. BIGNELL; Stonehouse, July 2, 1884.

MACROGASTER ARUNDINIS AT SUTTON, SURREY.—As the only localities for this insect mentioned in Newman's 'British Moths' are Holme Fen and Whittlesea Mere, it may interest some of your readers to know that I captured, on June 23rd, a male specimen of *M. arundinis* on a fence in Cheam Road. There were no reeds or marshy places near. — S. WORMALD; Glenthorne, Cheam Road, Sutton, Surrey, June 25, 1884.

PERONIA COMARIANA. — At page 20 of this volume of the 'Entomologist' some remarks appear upon *Peronia comparana*. These really refer to *Peronia comariana*, which is the strawberry-feeding species, while *P. comparana* feeds upon hawthorn. I do not know how the error occurred, but it should be corrected as early as possible.—J. B. HODGKINSON; 15, Spring Bank, Preston, Lancashire.

GRAPHOLITHA CÆCANA, &C., ON THE S.E. COAST. — A short stay on this coast has again enabled me to take *Grapholitha cæcana* in the same locality as last year. I have also found it in two other spots in the neighbourhood, and it is not unlikely that, when well worked for, its range may be considerably increased. Unfortunately the state of my health at the time prevented any very extended search on my own part, but probably some of the local collectors will meet with it next season. My other best captures were *Sesia chrysidiformis* and *S. ichneumoniformis*, *Heliothis peltigera*, *Homœosoma nimbella*; and *Stenia punctalis* was not uncommon. The best Tortrices were *Orthotænia antiquana*, *Catoptria microgrammana*, *Stigmonota leplastriana*, *Penthina gentianana*, *Eupœcilia implicitana*, *Argyrolepis zephyrana*, and *Conchylis alternana*. *Gracillaria ononiella* was represented by a solitary specimen. — GEO. COVERDALE; 24, Fleming Road, Lorrimore Square, S.E., July 17, 1884.

COLEOPHORA MARITIMELLA. — It was my good fortune to meet with the cases of this species, from which the insects are just emerging, rather freely along the Essex coast, in May, on *Artemisia maritima*. I hope soon to have duplicates.—GEO. COVERDALE; 24, Fleming Road, Lorrimore Square, S.E., July 17, 1884.

ELACHISTA DENSICORNELLA AND OTHER CAPTURES.—*Incurvaria canariella* was much more rare this year than formerly. One day recently I worked seven hours and only took three specimens, while another day produced fifteen examples, but nothing else worth boxing; so I left Arnside and journeyed to Grange; there I took two specimens of *Elachista densicornella*. This capture induced me to revisit the locality, when I took *Lampronia luzella*, eight *E. densicornella*, one *Tinea semifulvella* which deposited ova, one *T. albipunctella*, *Cleodora cytisella*, some *Pterophorus osteodactylus*, *P. tephradactylus*, *Dicrorampha herbosana*, *D. plumbana*, *D. plumbagana*, *D. consortana*, which were very large specimens, and evidently identical with the *distinctana* which I saw at the late Mr. Harper's sale. While lying down searching for the larvæ of *Depressaria capreolella*, I thought I would try to find ova of *Leucophasia sinapis* on the *Lotus corniculatus*, which was growing in profusion. I was, however, saved the trouble, for a male and female of that butterfly came flitting up and I secured them. Having placed the latter with some of the food-plant on my return, I now see a large number of eggs, which appear to be fertile and healthy. I may remark upon the very late appearance of the variety *salmacis* of *Lycæna agestis*, which was in fine condition and plenty in the last week in June. — J. B. HODGKINSON; 15, Spring Bank, Preston, July 3, 1884.

LATENESS OF THE SEASON.—After every promise of a remarkably early spring, and the expectation of insects appearing at least somewhere near their usual dates, the whole aspect of affairs has been changed by a six weeks' spell of bitter east wind during April and May, whereby the appearance of many species has been greatly retarded. For instance, *Anthocharis cardamines* was not seen here until June 3rd, a full month behind time; and the larvæ of *Vanessa urticæ* were also very late, none being found until June 12th, when I took several broods only just hatched, whereas on the same date last year this species had gone to pupa. — MARTIN J. HARDING; Cottisbrooke, Shrewsbury, July 3, 1884.

LEPIDOPTERA OF LONDON SUBURBS. — There is much truth in Mr. J. R. S. Clifford's remarks (*Entom.* xvii. 108) regarding the unvarying abundance of many lepidopterous insects in our suburban gardens. Not only are the common ones, especially among the Noctuæ, to be found year after year in the same gardens, but occasionally much esteemed visitors are chronicled, especially those rare species of the Sphingidæ which come over from the Continent. Many of our gardens are the remains of those park-like grounds which surrounded the villas of city merchants, and are now, owing to the great demand for building-sites, fast becoming things of the past. In these grounds a wealth of botanical life was usually encouraged; not only were the trees of every description that will flourish in this country to be found, but the cultivation of exotic plants afforded food for innumerable species. I was never more surprised than in the summer of 1882, when collecting in Epping Forest was far from good, to find that in some old grounds of the above description, and partly built upon, the Noctuæ were far more numerous than I could have imagined possible. It is true they were only such as Mr. T. W. Hall mentions (*Entom.* xvii. 89), yet they came in such numbers to "sugar" as to gladden the eyes of the most desponding collector. These cultivated grounds doubtless account for the halcyon days enjoyed by the older collectors in London, whose accounts of what they used to do within five miles of Charing Cross often appear incredible to the younger entomologists of this period. That these gardens still produce a large number of species is not astonishing when it is taken into consideration that many of the plants cultivated for show are very attractive both in appearance and odour, and, when here, the moths have little difficulty in finding among the great variety of vegetation, even in a small pleasure garden, something suitable for the food of their future progeny. One point which seems to have been overlooked by Mr. Clifford, and which to my mind appears one of the most potent reasons for the abundance of larvæ in our gardens, is the absence of birds of an insectivorous turn of mind. Such birds as the finches are of too timid a nature to remain long near the abodes of man, and nobody, I am sure, will accuse the London sparrow of an intense liking for caterpillars. Many good useful species for the cabinet are still to be obtained in the suburbs of London, and I am sure that we often go further than is necessary

for many of our common ones; but at the same time I should be among the last to discourage collectors of an exploring disposition. — W. H. WRIGHT; Secretary's Department, Inland Revenue, Somerset House, May 5, 1884.

INFLUENCE OF CIVILISATION UPON INSECTS.—The number of species of insects is prodigious, and the number of individuals to us infinite. Their fertility is proverbial, but the world is not destroyed by them, as the enemies which prey upon insects are innumerable. One of the most interesting branches of Entomology is the study of the relations existing between insects and their foes; and of all the great agencies man is the most potent. Man, from the earliest times, has fought against the advances of insect tribes. The nearer perfection man becomes, the more civilised, the greater is his power; and civilisation tends to produce less variety and more uniformity in Nature. I purpose enumerating a few facts in support of the last sentence. When the facts relating to the decrease of Mammalia are examined, man's influence is appreciated, and with Aves to a less degree; but with the Insecta his power is frequently overlooked. Comparing the British Isles of to-day with those of the early Britons, the first thing which strikes us is the large area occupied by villages, towns, and cities. What an area of forest, wood, and undergrowth must they have supplanted. Were a census possible of insects, taken as to numbers and species in A.D. 84 and A.D. 1884, would it not present a singular contrast? The increase of buildings, railroads, and canals has certainly lessened considerably the numbers of insects. The growth of towns is a necessity, and cannot be prevented. By cultivation of the land man destroys many species of indigenous plants, and consequently the insects which feed upon them. Land being drained causes plants which flourished previously to languish and die. Insects depending upon these given plants become extinct, e.g., *Polyommatus hippothœ*; the area of distribution of *Papilio machaon* is much diminished by drainage. Forests and woods being cut down alter the amount of moisture in the atmosphere, making the climate colder and drier, and so affecting insects. Man causes changes by his laws. The Bird Protection Act is already making a different result in the numbers of insects. Man is the only creature who collects and preserves insects. This makes a slight,

but hardly appreciable, different total, even if we remember the large numbers which are annually captured and preserved. Uniformity in Nature is also increased by the large areas growing the same kind of cultivated plants, instead of a various wild growth. Pasture lands and meadows have little variety of flora. Corn-fields, and all arable land and sheep-feeding districts, have a certain sameness, and orchards in the southern counties provide only a few kinds of fruit trees. The custom of having hedges of hawthorn gives encouragement only to those species which feed upon it. If we look into the future we must own that civilisation will still lessen the area for entomological research. Waste places will be enclosed; and even now there are only a few localities in this country which are in their primitive wildness. Residents in towns know it is difficult to find a spot where Nature is left undisturbed. Some who love Nature devoutly regret this; but everything must give way before the great strides of the giant progress. These remarks are only a few illustrations written *currente calamo* to call attention to the subject, as it is extremely interesting to note the effects produced by the wonderful assertion of the vast human race.—HERBERT E. NORRIS; St. Ives.

THE "DEATH WATCH" AND ITS SOUND.—As there seems to be a great deal of misapprehension with regard to the "Death Watch" and its sound, perhaps a few words on the subject may not be out of place, especially as one or two remarks in last month's 'Entomologist' are calculated to be misleading. The insects that produce this sound belong to the family Anobiina of the Ptinidæ; the species that are credited with producing the sound are *Anobium domesticum*, Fourc. (*striatum*, Ol.), and *Xestobium tessellatum*, Fab., which are quite different species, and not the same, as implied in the note in Entom., vol. xvii., p. 167; the former is a small insect, and is abundant in all old houses, its larvæ producing the small holes found in old furniture, and being commonly known to furniture-dealers as "the worm"; the perfect insects also have the power of boring: another species which is sometimes very destructive to furniture is *Ptilinus pectinicornis*; the much larger *Xestobium* is found in old houses and churches, but is also abundant in old oaks; *Anobium domesticum* itself is by no means confined to houses, but is sometimes common in old trees, old ivy, &c. Some of the species, as Professor Westwood observes, notably *A. paniceum*, feed on almost every substance,

devouring ginger, rhubarb, cayenne pepper, &c., even perforating tin-foil, in the larva state. They are very fond of biscuits; I have found them in profusion in an old tin that had been put by and forgotten. The wood-feeders alone produce the sound, not because of their structure, but because of the medium by which they are surrounded, and it is probable that the power is by no means confined to the two species, *A. domesticum* and *X. tessellatum*; the others live in the open country, and will naturally not be observed to produce the sound. The sound of the Death Watch is certainly not vocal, as is suggested by Mr. Clifford (Entom. xvii. 167); no insect produces a vocal sound, at any rate one that is appreciable to human ears. Sir John Lubbock, noticing the wonderful way in which ants communicated with each other, made very delicate experiments with the sensitive flame and microphone in order to ascertain if they communicated by sound, but although with the latter instrument he could distinctly hear the tread of their feet, the results were entirely negative. The hum of bees, &c., is produced by the vibration of the wings; the chirp of the cricket and Cicada and other insects by stridulation, or the rubbing of one rough surface against another on some part of the body; the so-called "squeak" of the Death's-head moth is produced by the same cause; several butterflies are provided with a stridulating apparatus, and produce a very distinct sound. The "tick" of the *Anobium*, then, is evidently caused by some hard portion of the insect coming in contact with the wood, either by the mandibles gnawing the wood or by the head being rapped against it. If we adopt the former theory, there is no need for further explanation. Professor Westwood, from a series of observations made by him, is inclined to think that the sound is produced by the larva as well as the perfect insect, as they gnaw the wood while boring their burrows. If, however, the sound is produced by the head being rapped against the wood, this must be apparently done for one of two reasons: either as a call from the insect to its mate, or in order to ascertain the thickness of the wood which still remains unbored. The sound is not one that would be produced by mandibles in gnawing, but is a distinct sharp rapping sound, and would rather lead us to adopt one of the latter explanations: the question, however, of the real cause still remains to be decided. The reason why the beetle has got its ominous appellation of the "Death Watch" is

obvious; the sound is too low to be heard except when there is perfect stillness, as at night; people seldom sit up alone at night, except to nurse sick people, and as a rule people who are very ill, and in such a case their nerves are often strung to the highest tension; the sound then appears to them doubly hard and exaggerated, and, when the patient has died, the sound and the death have naturally become connected together in the minds of superstitious people.—W. W. FOWLER; Lincoln, July 16, 1884.

CÆLIOXYS ELONGATA, *Lep.*, EMERGING FROM A COCOON.—It may be interesting to note a very curious departure from the supposed ordinary course of this bee, which I bred on July 7th from a cocoon found on a thistle on June 26th last. A young friend, who has been doing a little in Entomology for the past seven years, took unto himself a wife, and during his wedding trip saw a *Vanessa cardui* larva on a thistle; it then struck him that he may as well collect a few larvæ of *V. cardui*, and in searching the thistles he found the cocoon in question, and at once came to the conclusion it was an ichneumon cocoon. Knowing my weakness for the Ichneumonidæ, he boxed it, brought it home, and gave it to me, with another supposed ichneumon, which is without doubt a species of Syrphidæ. The cocoon is very compact and hard, and it has resisted my efforts to soften a portion of it in spirits of wine and afterwards in boiling water; I was desirous of doing this to ascertain if possible of what the outside covering consisted; I very strongly suspect it is portions of the florets of a thistle: it has every appearance of it, and in examining it with a strong lens I can see the silken cords or web which formed the foundation of the cocoon; my young friend thinks the web was made by the larva of *V. cardui*, the web being the cause of attracting his attention to the thistle, thinking it contained a *V. cardui* larva.—G. C. BIGNELL; Stonehouse, July 14, 1884.

WASP CAPTURING *SESIA MYOPÆFORMIS*.—When walking round my garden this afternoon, after the storm, I struck at something flying quickly, which I thought might be one of the larger ichneumons, and to my surprise found a wasp and a male *Sesia myopæformis* in my net; the former was doubtless carrying the moth in its mouth. The clearwing was quite lively and is apparently perfect, being none the worse for its temporary captivity.—EDWARD A. FITCH; Maldon, July 26, 1884.

DESCRIPTION OF A NEW SPECIES OF *CHARAXES*
FROM THE MALAY PENINSULA.

By W. L. DISTANT.

CHARAXES DURNFORDI, n. sp.

♂ Wings above dark brownish-ochraceous; anterior wings with the apical half blackish, containing two transverse series of greyish-white angulated spots placed between the nervules, and with a somewhat obscure series of small greyish-white marginal spots, those at the outer angle largest and most distinct; two small obscure greyish-white spots at end of cell, separated by the upper discoidal nervule; posterior wings with a very broad marginal greyish-white fascia, inwardly lunulated and margined with blackish, containing a central series of blackish spots with whitish centres, placed between the nervules—that at anal angle duplex—and with a narrow submarginal blackish line. Wings beneath brownish grey; anterior wings with the cell containing a small black basal spot, and centrally crossed by a darker spot margined with blackish, an irregular darker fascia margined with blackish crossing wing at end of cell, where it is widest; beyond the fascia the ground colour is paler, the whitish spots above are more or less distinctly visible beneath, a waved dark line separating the two discal series; posterior wings with two irregular darker fasciæ margined with blackish, one at base, the other crossing disk and terminating on abdominal margin; the outer white fascia and spots above faintly visible beneath, its margin denoted by two waved or lunulated lines, the innermost bluish, the outer fuscous with the intervening ground colour ochraceous. Body above and beneath and legs more or less concolorous with wings.

Exp. wings ♂ 93 millm.

Hab.—Malay Peninsula; Sungei Ujong (Durnford).

This beautiful and exceedingly distinct species seems to find its nearest ally in the Amboinese *C. euryalus*, Cram., and belongs to that division of the genus in which the caudate prolongation to the posterior wings, at the apex of the third median nervule,

is obsolete, whilst that at the apex of the first median nervule is short but distinct.

This species will be figured in the Appendix to my 'Rhopalocera Malayana.'

REVIEW.

Report on the Tea-mite and the Tea-bug of Assam. By J. WOOD-MASON. London: 1884. 20 pp. Royal 8vo, with three coloured plates.

IN his introduction the author says, "Of the numerous animals which prey upon the Tea-plant, two only are at present known to do such injury to it as materially diminish the profits of owners of tea-estates; these are the Tea-bug or 'Mosquito-blight,' and the Tea-mite or 'Red Spider' of planters. The former of these two formidable pests damages the young and tender shoots required for manufacture into tea . . . while the latter of them confines its ravages to the full-grown leaves, and by so injuring these organs as to unfit them for the performance of their important functions, checks the growth of green shoots, and prevents the bushes from flushing."

The Tea-mite, which has not hitherto been described, Mr. Wood-Mason proposes to name *Tetranychus bioculatus*, in allusion to its double (really two pairs of) eyes. This is a very minute animal, and to the naked eye appears only as a dull-red speck, but its ravages seem to be very widely spread and serious to the planters, old gardens suffering to a greater extent. No satisfactory remedy appears to have as yet been discovered.

The Tea-bug is a member of a genus of Capsidæ, which is characteristic of the Indo-Malayan Fauna, and has been named by Mr. F. Moore *Helopeltis theiovora*. The author gives an interesting account of this animal also. It appears that a variety of the tea-plant imported from China is alone attacked, while the indigenous species is free from the pest. The latter shrub produces a liquor "much more pungent and rasping" than the imported variety, so that some chemical difference in the plants may cause the "bugs" to avoid the native plants.

Altogether Mr. Wood-Mason has given us an interesting contribution to Economic Entomology.—J. T. C.

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LYCÆNA ARGIOLUS COMPARED WITH THE AMERICAN LYCÆNA PSEUDARGIOLUS.

By J. JENNER WEIR, F.L.S., F.Z.S., &c.

In part xii., second series, of W. H. Edwards' 'Butterflies of North America,' there is a most valuable contribution on that singularly polymorphic species *Lycæna pseudargiolus* of Boisduval and Leconte. This insect is found as far north as 54°, and as far south as Mexico. In response to its environment it has varied exceedingly, and the different races have been regarded as distinct species; but Mr. Edwards has now arrived at the conclusion that they "constitute one polymorphic species."

I must refer the readers of this magazine to the work above quoted for a complete account, but will shortly state some of the main facts of the general history of the insect.

Lycæna pseudargiolus varies according to the latitude and longitude in which it is found, or in other words is topomorphic; according to the season of the emergence of the imago, horeomorphic; and besides is dimorphic and trimorphic. A melanic variety has also been developed; two hermaphrodites are figured, and two heteromorphic forms.

1. In the high boreal regions the species is one-brooded and dimorphic,—*L. lucia*, Kirby, and *L. violacea*, Edw.

2. At about lat. 45° it becomes double-brooded, the second emergence being *L. neglecta*, Edw.; and the spring emergence has become trimorphic by the development of an intermediate form, *L. marginata*, Edw., between *L. lucia* and *L. violacea*.

These four forms inhabit the country, at least as far south as Long Island.

3. At about lat. 39° , on the Atlantic side, two forms of the first generation, viz. *L. lucia* and *L. marginata*, are found to have been suppressed; and the third, *L. violacea*, remains to represent that generation. The blue colour has, however, become darker, and a melanic male has been developed; but no melanic female has yet been discovered.

4. In lat. 40° , at the west, *L. lucia* and *L. violacea* are found. The second emergence is *L. neglecta*; and it is also remarkable that in Colorado a melanic male of the spring emergence is also found.

5. In Arizona, at or about lat. 33° , *L. violacea* alone appears, but in a modified form var. *cinerea*, Edw. The second generation apparently is *L. pseudargiolus*, Bois. and Lec., no black male and no *L. lucia* having been taken.

6. From lat. 40° or 39° southward, in the Atlantic district, the summer generation is *L. neglecta*; but there is an intermediate or interpolated generation flying in May, viz. *L. pseudargiolus*.

7. In California and Arizona the species is represented in part by what is very near to *L. neglecta*, or else a small *L. pseudargiolus*, viz. *L. echo*, Edw., but mainly by a modified form, *L. pius*, Bois., which has two generations not differing from each other.

Such is a very brief outline of the changes which *L. pseudargiolus* undergoes in the Nearctic Zoogeographical Region.

I do not find in any of the works of British authors the least allusion to the horeomorphic and dimorphic condition of *Lycæna argiolus*, Linn., as it exists in these islands. Stainton, Newman, and Lang are silent on the subject; nor am I aware whether in the more northern districts in which the insect is found, e.g., Cumberland, Westmoreland, and Yorkshire, it differs in any respect from those found in the most southern counties, nor whether in the former districts it is one-brooded, a point I should be very glad to know.

In my late garden at Blackheath the holly and ivy thrive. I had numerous varieties of each, and had therefore opportunities for more than quarter of a century of seeing *L. argiolus* at the periods of the spring and summer emergences of the imago. I

cannot detect any differences in the males which appear at these two periods; but with regard to the females the case is widely different.

The spring form only of the female is figured by Stainton in his 'Manual,' by Newman in his 'British Butterflies,' and by Lang in the 'Butterflies of Europe'; the description of the female given by the latter author agrees more with that of the autumn emergence.

The female of the spring emergence has been accurately described by Newman, 'British Butterflies,' p. 135, thus:—"In the female there is a broad hind-marginal black band on the fore wings, and a narrow black hind-marginal border on the hind wings, and just within this is a series of six transversely oblong black spots." It is clear to my mind that my late dear friend had a female of the spring emergence only before him when he wrote this excellent description.

The females of the spring emergence closely resemble the figure of *L. marginata*, given by Edwards in 'Butterflies of North America,' vol. ii.,—*Lycæna*, ii., fig. 4,—but are lighter on the under sides of the wings than fig. 3 of the same plate, which shows the under side of the same variety.

The females of the autumn emergence are very much more suffused with black. It may be said that those of the first generation are blue on the upper side of the fore wings, with a black hind margin; but the females of the second generation are black on the upper side of the fore wings, with the centre of the wings suffused with blue.

Although, as I remarked before, Dr. Lang in the 'Butterflies of Europe,' plate xxxi., fig. 1, has figured the female of the spring emergence, his description is apparently taken from a female of the autumn emergence, as known in England. His words are:—"The female has the outer half of the costa and all the hind margins of the fore wings broadly brownish black; the hind wings are similarly brownish black on the costa; sometimes the hind margin is also dark brown, and always a row of black dots." The specimen from which this description was taken must, I think, have been one of the second generation. I may add that generally the females of this emergence have a more or less well-defined black discoidal spot on the upper side of the fore wings, and agree very closely with *L. pseudargiolus*, figured

by Edwards in the work above referred to,—*Lycæna*, ii., fig. 19, vol. ii.

It thus appears that the female of the spring emergence of *L. argiolus* in England resembles that of one of the varieties of *L. pseudargiolus*, which appears at that time of the year in America; and in a similar manner the second-generation female is exceedingly like one of the varieties of the American species, which appears later in the year as a second generation.

The parallel between the two species does not end in these resemblances only. In Edwards' 'Butterflies of North America,' second series, a form of the female of *L. pseudargiolus* is figured,—*Lycæna*, plate ii., fig. 9. In this beautiful insect the blue gives place on the upper side of the wings to a lovely silvery colour, somewhat like that of *L. corydon*; the black edging on the costa and hind margin of the fore wings is very broad, and the discoidal spot is much more marked than in the blue form. This variety was also figured, but without the discoidal spot, in the first volume of the 'Butterflies of North America,'—*Lycæna*, plate ii., fig. 3,—as *L. pseudargiolus*, and a similarly coloured insect as *L. neglecta*, fig. 6, unaccompanied by any figure of the blue form. I have taken an insect, coloured exactly in every respect like that figured by Edwards in the second series, at Brenchley in Kent, in summer, and was struck with the strong resemblance it bore to the butterflies figured in the first volume, above adverted to; the only difference being the presence of the discoidal spot in the Kentish specimen. I may remark that Edwards does not figure a male of this silvery colour, so that it is probable the insect is dimorphic in the female sex only.

I have received specimens of the American insect from Mr. Walter Haydon, who captured them at Moose, lat. 51°. It is there double-brooded; the females exhibit the horeomorphic variation, and are apparently *L. lucia*, Kirby. Mr. Haydon found the species on the wing from June to September.

Specimens of the Russian female *L. argiolus*, received from the late Mr. Field, of St. Petersburg, are exceedingly dark both on the fore and hind wings on the upper side; the discoidal spot, absent in the American *L. lucia*, is well defined in these northern specimens; the fore wings have but little blue, and the hind wings are merely shot with that colour. They most nearly resemble the American *L. cinerea* of Edwards, 'North American

Butterflies,' vol. ii.,—*Lycæna*, plate ii., fig. 17. I am ignorant as to the time of the year they were taken.

Mr. Kane, who takes such an intelligent interest in the variation of insects, has just sent me two specimens of *L. argiolus* taken by himself. The first, at Vichy, in May, is on the upper side almost identical with that figured by Edwards, vol. ii.,—*Lycæna*, plate ii., fig. 4,—as *L. marginata*; the fringes of the secondary wings are in the European specimen spotless, and in the American slightly spotted. The other specimen, so kindly sent, is a most remarkable butterfly. It was taken either late in March or early in April; and should have a narrow black border to agree with the North European spring form; but the insect has nearly as broad borders to the fore and hind wings as the Russian specimens above described, and I should have deemed it a typical specimen of the summer emergence. Mr. Kane writes that the Provençal specimens he has seen are all remarkable for the breadth of the apical and marginal borders.

I venture to think that this Southern European form is the result of the warmth of the climate at Hyeres, where it was captured. In so sunny a district the caterpillars may feed almost all the year round, and never remain long in the pupa state. An insect much resembling this specimen is figured by Edwards, vol. ii.,—*Lycæna*, ii., fig. 21,—as *L. piasus*. This subspecies, as I remarked before, has, according to Edwards, two generations *not differing from each other*.

If I be right in this conjecture the parallel between the American and European species is completed in the southern varieties in each continent. The conclusion is forced upon me that, if *L. pseudargiolus* varies from *L. lucia* to *L. piasus*, then all the forms of *L. pseudargiolus* are but races of *L. argiolus*, Linn.

Chirbury, Beckenham, Kent, August 17, 1884.

A WEEK'S COLLECTING IN UNST.

BY CHARLES A. BRIGGS.

LEAVING London from Euston Station by the limited mail on the 6th July, the next day found Mr. E. G. Meek and myself at Aberdeen, somewhat the worse for wear. Here a few hours

involuntary stoppage occurred, pending the arrival from Leith of the mail boat, 'St. Magnus.'

We left Aberdeen at midnight on the 7th, and on the next day took advantage of the 'St. Magnus' stopping for an hour at Scapa Pier (which is at the back of Kirkwall, on the mainland of the Orkneys) to go on shore. There we found males of *Lycæna alexis* flying vigorously; but as our nets were unfortunately packed up, and were only armed with pill-boxes, we reluctantly left them to continue their flight. We also noticed a *Pieris*, either *P. brassicæ* or large *P. rapæ*, but apparently the former; one nearly fell a victim to the seductive finger and thumb, but just escaped.

The *Lycæna alexis* recorded in the 'Entomologist,' vol. xv., p. 2, were from the Island of Hoy, which is some distance to the south, and near the coast of Scotland. Our observation, therefore, is the most northerly modern record of the species, although no doubt it is found all through the Orkneys.

We arrived at Lerwick, on the mainland of Shetland, towards what ought to be nightfall on the 8th; and finding that the local steamer was luckily starting for the North at 4 o'clock next morning we arranged to go by her, which we did, arriving at our destination, Balta Sound, Unst, on the afternoon of the 9th. Here an entomological friend, Mr. Roper-Curzon, had secured us lodgings under Mrs. Hunter's hospitable roof; and lucky it was that he had been able to do so, as there are no other lodgings to be got at Balta Sound; and one fellow-traveller had to convey his belongings back to the steamer, and return South sorrowing. Nothing daunted by our three days' travelling, the indefatigable Mr. Meek, scarcely allowing us time to swallow a hasty tea, rushed us off, under Mr. Curzon's guidance, in quest of *Hepialus humuli* var. *hethlandica*, which we soon got amongst, but found much worn. *H. velleda* was decidedly rare, but probably had been more common. In the same place *Emmelesia albulata* in every shade of variety, from the type to var. *thules*, was to be found, but worn to rags, only a very few being worth boxing.

Coremia munitata, abandoning the habits of its Scottish brethren, was only to be found in marshes flying gently by night. *Melanippe montanata* was on the wing in some quantity, but nearly all were males. The females we got were chiefly taken by searching the heather, on the top of which they were to be

found fluttering. The males flew freely throughout the night, and even in broad sunshine in the early morning, a fact which I wish we had discovered one day earlier than we did. *M. fluctuata* was nearly over; but the few specimens we saw were very large and dusky. The strange form *Eupithecia nanata* (?) still lingered on amongst the heather, but were very worn.

Sugaring was fairly successful, although, from the flight of the Noctuæ being limited to a couple of hours, one was at first induced by the broad twilight to put off visiting the sugar until too late. *Hadena adusta* in grand variety was common; as also were *Agrotis suffusa*, *A. porphyrea*, and *Noctua conflua*. Of *Mamestra brassicæ* and *M. furva* one specimen of each was taken at sugar; a second specimen of the latter, with one *Dianthœcia conspersa* and one *Stenopteryx hybridalis*, being the sole results of a night wasted at *Silene* flowers. *Triphæna pronuba* was common, and, as usual, pugnacious, driving off the better species. Although they varied greatly, yet there was little by which to distinguish them from southern specimens. A most unexpected species was *T. subsequa*, two specimens of which were taken. Of *Mamestra oleracea* and *Apamea oculatea* a few specimens were captured, including a nice variety of the latter. *Plusia gamma* was common on the wing at ragged-robin and other flowers. Neither *Crymodes exulis* nor *Pachnobia hyperborea* were out, which was a great disappointment to us.

The Pyralidæ were but scantily represented. *Herbula cespitalis* was common, but worn; *S. hybridalis* was to be found occasionally; while of the Scopariæ, *S. atomalis* was common on a hill-side, *S. coarctalis* occurred at the door-step of our lodgings, and *S. pallidulalis* turned up at a bog.

Of the Crambidæ, *Crambus pratellus* was common; *C. hortuellus*, *C. pascuellus*, and *C. perlellus* more rare; while *C. culmellus* was most abundant. Of the latter species a fine dark variety occurred that almost raised hopes of a novelty.

Of the Tortrices, *Mixodia schulziana* was common among heath; *Sericoris lacunana* and *Clepsis rusticana* on hill-sides; and *Bactra lanceolana* in marshes. We also noticed a few *Phoxopteryx unguicana* and *Eupæcilia ruficiliana*; one *Orthotænia antiquana* was disturbed from a turf-wall; while a few large and dark *Xylopada fabriciana* and *Sericoris littorana*, which was just coming out, completed the list. In searching among thrift for

the latter a large mine in the roots of one plant seemed to point to the presence of *Sesia philanthiformis*; but this certainly requires confirmation.

In the Tineæ, *Cecophora pseudospretella*, *Endoris fenestrella*, and *P. cruciferarum* were abundant; the latter, no doubt by its numbers, serving to conceal the presence of several other species. *Glyphipteryx cladiella* was in tolerable numbers; while one or two species still await identification.

A truly magnificent humble-bee was not rare.*

A collector of Diptera and caddis-flies would reap a rare harvest.

Midges were most malevolent, choosing for their worst attacks the time when one was boxing *M. montanata* from a sopping wet and heavy net.

From the above notes it will be seen that of Macro-Lepidoptera five species—namely, *Mamestra brassicæ*, *Agrotis suffusa*, *Triphæna snbsequa*, *Apamea oculatea*, and *Hadena oleracea*—are new to the Shetland Islands. How many more are new to Unst itself cannot at present be ascertained, as Mr. Jenner Weir, in his notes in the January number of the 'Entomologist' for the present year, has unfortunately treated the islands as a whole, and has not given a complete list of the species taken in Unst by Mr. McArthur last year. It would appear from Mr. Jenner Weir's notes that twelve species occurring in the mainland were not observed in Unst, but which these twelve were we are not told. No notes of Mr. McArthur's Micro-Lepidoptera from Unst, or of his second visit to the mainland, have as yet been published.

I cannot say that we were favoured by the weather. For the first week we had, with one exception, either high winds or sea fogs so dense that we constantly had to wring our nets out; while on the 16th the weather completely broke up, and gales and incessant rain stopped both day and night work, until our departure on the 19th terminated one of the most enjoyable trips I have ever had.

The midsummer sunset and sunrise—and it is difficult to say

* Mr. Briggs having submitted a specimen of this bee for identification, it proves to be *Bombus smithianus*, White (see Smith's Catalogue, 2nd edition, p. 202). E. Saunders says of it in his Synopsis,—“This beautiful species has at present only been found in the extreme north, and is recorded from Shetland and the Hebrides.”—E. A. F.

where the one ends and the other begins—seen from Hermes Ness, the most northerly point of the kingdom, is a sight to be remembered; while throughout the night hours, during the whole of which there is light enough to read by, the melancholy wail of Richardson's skua and the harsh grunt of the great skua, enraged at the unwonted disturbance of their sanctuary (for the latter bird is now preserved on this point, which, with the neighbouring Island of Foula, is their sole home in the British Isles), go to make up an experience never to be forgotten.

55, Lincoln's Inn Fields, August 13, 1884.

NOTES ON SOME MICRO-LEPIDOPTERA REARED IN CAPTIVITY.

BY GEORGE ELISHA.

THE following species have emerged in my cages this season, up to the end of July:—*Sericoris euphorbiana*.—Some fine specimens from larvæ taken in the Warren, Folkestone, feeding on the shoots of the sea spurge (*Euphorbia paralis*), eating out the heart of the shoot. They were collected, when nearly full fed, in the beginning of last August. *Phtheocroa rugosana*.—Seven lovely specimens from larvæ, found near Wrotham, Kent, feeding on the shoots of *Bryonia dioica*. *Retinia turionana*.—Larva found at Box Hill, feeding in the shoots of young firs (*Pinus sylvestris*). This species, which is usually more or less infested with ichneumons, sometimes so badly that not more than three or four moths emerge out of every dozen larvæ collected, has this year been entirely free from them; not a single ichneumon has been bred, out of about three dozen larvæ collected; indeed I may mention that ichneumons generally have been very scarce in my cages this year. From the roots of tansy (*Tanacetum vulgare*) I have bred *D. tanacetana* plentifully, and a fine series of *Dicrorampha alpinana*; also from the same roots *D. sequana* and *D. petiverana*. The roots were dug at Deal, during a three weeks' stay in December last year, the weather at the time not being at all propitious for digging up roots, as the snow and frozen leaves and sticks had to be scraped away before reaching the earth. During the same visit to Deal, I also found the larvæ of *Argyrolepis badiana*, and many other

species of stem and root-feeding larvæ; but I have been amply repaid for all the unpleasantness of collecting under such circumstances, by the number and splendid condition of the species and specimens bred. *Eupœcilia ciliana*.—Some nice specimens from larvæ collected at Box Hill in the beginning of July, feeding on the seeds of cowslip. The larvæ require rotten wood or sticks to pupate in. *Grapholitha nigromaculana*.—A few specimens from larvæ found feeding in the seed-heads of ragwort, on the salt marshes near Thames Haven. The plants that are infected are readily seen by their discoloured appearance, and by pulling off some of the pappus the larva is seen snugly ensconced beneath. *Eupœcilia udana*.—A fine long series emerged, a few each day, for at least ten or twelve weeks. The larvæ were found feeding in the stems of water plantain (*Alisma plantago*) in Hackney Marshes. I also found the larva at Deal, where the food-plant occurs abundantly in the ditches to the left of Sandy Lane. *Catoptria tripoliana*.—A long and variable series from larvæ feeding on heads of *Aster tripolium* from Canvey Island. This species is at least ten months in the larval state. *Ypsolopha alpella*.—A few from cocoons found on oaks at Wanstead. *Y. horridella*.—A fine series from larvæ on blackthorn at Loughton. This, I think, is one of the most lively larvæ I ever saw, jumping and shuffling about in all directions; it must be possessed of wonderful muscular power. In shape it is the usual Cerostoma-shaped larva, tapering at each end, bright green, with a distinct white dorsal line. *Depressaria angelicella* freely emerged from larvæ collected near Sandwich in June. They are to be found, twisting and crumpling up the leaves of *Angelica sylvestris*. *D. cnicella*.—Some very fine specimens from larvæ found at Deal and Southend, eating out the shoots of sea holly (*Eryngium maritimum*). This species is not at all pleasant to collect, owing to the hard and prickly nature of the food-plant. *D. subpropinquella*.—A long series from larvæ found commonly at Sheerness, on the banks of a disused canal, under thistle leaves, mining galleries covered with a slight web, along the leaf-ribs. *D. alstrœmeriella* and *D. weirella* both bred rather freely from larvæ in folded leaves of hemlock (*Conium maculatum*). I was much surprised to breed the latter species, not having the least idea at the time there were two species among the larvæ feeding. I collected them thinking they were all *D. alstrœmeriella*; and although I changed their food four or five times, I

never noticed any particular difference in the larvæ. It was therefore rather an agreeable surprise to see *D. weirella* emerge, for I much wanted them, having only four or five very poor specimens in my collection; so light and faded were they, that I could not identify my bred ones with them, nor could one or two of my friends. Mr. C. G. Barrett, with his large experience, very soon recognised them and kindly named them for me.

D. arenella.—Some nice specimens from larvæ in the shoots of burdock at Bexley; also *P. lappella*, from the seeds.

Gracilaria semifasciella.—A few specimens from Box Hill. This species, as regards ichneumons, was the exception to what has been the rule this year with my larvæ; nearly all those of this species collected were destroyed by these little pests, which spun their white cocoons, fastened at each end by a single thread to the leaf, close to the remains of their victims.

Coleophora inflatella.—A fine long series from larvæ found in the lanes about Croydon, feeding on the seeds of *Silene inflata*. They seem to prefer the dry seed-heads to the unripe pods, for most of those I found were on the dried-up seed capsules, which would scarcely bear touching without breaking off.

C. artemisicolella.—A fine long series from larvæ found feeding on *Artemisia maritimum* at Southend. This species is generally very difficult to rear, but this year, from some cause, they emerged very freely.

C. wilkinsonella and *C. ibipennella*.—A nice series of each, from larvæ found rather sparingly on birch at Wanstead.

Laverna raschkiella.—A few from larvæ mining the leaves of *Epilobium* at Box Hill.

Pterophorus galactodactylus.—Some nice specimens from larvæ under leaves of burdock. I was rather late for this species, but the riddled state of the leaves was a proof of the numbers that had been feeding, most of which had disappeared.

P. lienigianus.—A very long and fine series from larvæ found at Deal in June, on *Artemisia vulgaris*. By careful searching I managed to secure a good supply; they were no trouble to rear, and I think every larva I found emerged a perfect specimen of this insect.

From the above few notes it will be seen that I have no reason to be dissatisfied with the season so far, but rather the reverse; for I had species emerge, in some cases very freely, the larvæ of which have hitherto given me the greatest trouble to get through the winter at all.

THE ACTION OF AMMONIA UPON SOME LEPIDOPTEROUS
PIGMENTS.

BY GEORGE COVERDALE.

Two or three years back, some entomological friends induced me to kill all my insects with ammonia, instead of employing potassium cyanide, and I have never regretted the change I then made. Nearly the first species so treated was *Melanargia galathea*, and on opening the pill-boxes I was much surprised to find every one of them of a beautiful primrose-yellow colour. In a few moments the primrose-yellow had vanished and the insects were of their normal white again. Evidently this phenomenon was due to the volatile ammonia, so I held a specimen over the bottle and instantly the primrose colour returned, only to disappear again with the departure of the pungent ammoniacal fumes. The reagent employed was a saturated aqueous solution of ammonia, and the black pigment of the wings remained unchanged throughout.

Now here was something of great interest and well worth investigation, so I determined to follow it up, and since that time have never lost an opportunity for experiment or study. Many of my friends are now familiar with the results obtained, but as they appeared to be previously unknown to all those with whom I have communicated on the subject, I have thought it best to place them on record. They may be well known and authenticated, but to ascertain this a careful search through the vast mass of the chemical and microscopical literature, both of this country and the Continent, would be required, and for this my spare time is quite inadequate. I must therefore crave the indulgence of those who may be familiar with the facts herein recorded. Naturally, the first species selected for experiment was *Melanargia galathea*. As before, ammonia gave the primrose coloration. The next reagent employed was a solution of potassium hydrate, in which pieces of the wing were placed, and they immediately turned yellow. Other alkalies, such as solutions of sodium hydrate and barium hydrate, were tried, and gave similar results, the only difference being that with the fixed alkalies the primrose coloration was permanent, whereas with ammonia it was necessarily fleeting.

As alkali turned the pigment yellow, acids I thought might prevent this, or even produce another colour. Accordingly the wings were treated with a great many acids, the chief being sulphuric, nitric, sulphurous, hydrochloric, phosphoric, and acetic. With all these, when used in excess of the alkali, the pigment was restored to its natural white colour. I also found, that whenever the liquid employed was exactly neutral to both red and blue litmus, the pigment remained unchanged, whilst the slightest addition of alkali produced the primrose-yellow, and when acid predominated the normal colour prevailed. Thus, we see, this pigment is a good test for alkalinity.

To enumerate all the species experimented upon would occupy too much space, so I will only give the most important. As some Continental species are mentioned, I have followed Staudinger's arrangement. *Papilio machaon* and other *Papilios* were unchanged, and the same may be said of the genus *Thais*. *Parnassius apollo*, *P. delius*, and *P. mnemosyne* turned a pale yellow. With such semitransparent species a deeper coloration could not be expected, from the small amount of pigment present.

None of the species of *Aporia*, *Pieris*, or *Anthocharis* showed any alteration with ammonia, but *Leucophasia sinapis* and its vars. *lathyri*, &c., exhibited a delicate primrose colour. Not a single species in *Colias*, *Rhodocera*, *Thecla*, or *Polyommatus* was changed; but the behaviour of the species of *Lycæna* was extremely curious and somewhat unexpected. *L. argiades*, *argiolus*, *alsus*, *acis*, *alcon*, *arion*, and *euphemus* remained unaltered. *L. bætica*, *ægon*, *argus*, *optilete*, *orbitulus*, *eros*, *alexis*, *eumedon*, *amanda*, *adonis*, *meleager*, *jolas*, and especially *agestis*, *corydon*, and *damon* were beautifully suffused with primrose on the under side and cilia, wherever the white pigment occurs. It is difficult to say why some of the species in this genera are unaffected, whilst others exhibit the most gorgeous colouring; but in the case of *argiolus* at least this may be accounted for. The pale bluish white of the under side is not the result of white pigment at all, but is due to reflected light from the almost pigmentless scales, in which a change could not be looked for. All the species which were examined in *Nemeobius*, *Charaxes*, *Apatura*, *Limenitis*, *Vanessa*, *Melitæa*, and *Argynnis* exhibited no change. In the Satyridæ, besides *Melanargia*, *Æneis ællo* is clearly suffused with primrose

beneath. In *Satyrus*, *S. circe* and *S. briseis* have the white bands changed, but *S. alcyone* and *S. semele* are not affected. *Erebia* and *Pararge* are alike unchanged. *Cœnonympha hero*, *C. arcania* (and vars.), *C. pamphilus*, and *C. davus* have the cilia and under side deeply suffused with yellow. Of the Hesperidæ, *Spilothyris alceæ*, *Syrichthus alveolus*, *S. serratulæ*, and *S. alveolus*, all have the whites changed to primrose, but *Nisoniades*, *Hesperia*, and *Carterocephalus* are not affected.

With the Heterocera I have obtained but negative results, although the number of species operated upon are to be counted by hundreds. It would be unsafe to generalise with such scanty data to go upon, but a few remarks may be ventured. The white pigmentary deposits of *Pieris* and *Melanargia*, although to the eye the same, must have a very different chemical constitution, and at one time I thought the negative ammonia results would be a good character of the Pieridæ, in contradistinction to *Melanargia*, &c.; but facts would not support this speculation, for *Leucophasia* proved refractory, and the Satyridæ gave results by no means uniform. Many more experiments must be performed, Nature must be thoughtfully questioned again and again before we can possess a firm basis for speculation.

Hitherto changes of colour only have been dealt with, and few reagents employed, but by recent experiments on the solubility of the various pigments in different media, most interesting facts have been brought to light, which in the future I hope to communicate. What a wonderful and lovely sight is the under side of *Vanessa atalanta*! It has at least a dozen shades of colour, most exquisitely mingled. Some day these colours will be analysed and their constitution made known. The results herein recorded may then be of service.

24, Fleming Road, Lorrimore Square, S.E., Aug. 16, 1884.

DESCRIPTION OF A NEW SPECIES OF *JUNONIA*.

BY H. C. LANG, M.D., F.L.S.

A FEW days since I noticed some specimens in the British Museum Collection included in the series named *Junonia orithya*, Linn., bearing the locality label "Turkey," and at once proceeded

to examine them, as coming within the range of the European fauna, a position which this species has not hitherto held, the only *Junonia* included in Staudinger's Catalogue being *J. ænone*, L., which occurs in Syria. On examination I at once saw that these specimens, coming from Bagdad, differed very materially from the oriental type of *J. orithya*, L., which inhabits the Indian region. Mr. Butler then showed me a specimen in a collection, made recently by Major Yerbury at Aden, which exactly corresponded to the Turkish specimens collected by Loftus in 1850. From its geographical distribution and its appearance it seems perfectly entitled to rank as a new species. I therefore describe it.

JUNONIA HERE, n. sp.

Expansio alar. 40-43 mm.

Differt ab *orithya*, L., staturâ paginaque alarum.

♂. Alis, supra nigris; serie marginali macularum albicantium; maculâ apicali albâ; intus fasciâ brevi albâ, cujus inferiore parte extendit fascia latior cærulea, margine interiore recto, maculam nigram obscuré ocellatam continens; ocello apicali cæruleo obscure rubro-annulato; duabus aut tribus maculis subcostalibus cæruleis. Alis posticis cæruleis; parte basali nigra; maculis ocellatis duabus (ut in *Orithya*), sed superiore earum ocello fere obsoleto; margine externâ cærulea (raro albidâ), lineis nigris duabus. Subtus, alis anticis, colore pallidiore quam in *Orithya*, L.; angulo anali nigrescente; macula anali sine annulo rubro. Posticis ochraceo-gricescentibus, parte externa fusco-umbrata; ocellis nullis, sed in ♂ et ♀ puncto cæruleo juxta angulo anali.

♀. Alis supra posticis fusco-cærulescentibus; ocellis majoribus et bene notatis, cætera ut in mare.

Habitat, Turciâ Asiatica et Arabia.

Differs from *Junonia orithya*, L., in being smaller, and in the pattern of the wings. The fore wings have the blue submarginal fascia straighter on its inner border, and there are no red subcostal spots, but only two or three indistinct blue ones. The hind wings (in the male) have the upper of the two ocellated spots, found in *J. orithya*, reduced to a black patch, or with a very indistinct ocellus. The hind margin is generally blue with black lines, sometimes whitish, but never as distinctly white as in *J. orithya*. The under side differs remarkably from *J. orithya* in the

general paleness of the ground colour. The fore wings are shaded with black towards the anal angle, and the spot at that point is without any orange ring. The hind wings, instead of having a reddish tinge, are light stone-colour, the hind marginal portion slightly darker than the rest, separated from the basal half by a brown line passing from the costa to the anal angle; there are no ocellated spots, but only a small blue dot near the anal angle. The female has the hind wings slate-colour above, and the ocellated spots are prominent and well defined.

Bagdad; Loftus, 1850. Aden; Yerbury, 1883.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS DAPLIDICE AT DOVER.—On the 11th inst. I had the pleasure of receiving from a correspondent at Dover a pair of *Pieris daplidice*, taken there the previous week.—C. A. BRIGGS; 55, Lincoln's Inn Fields, August 13, 1884.

ARGYNNIS LATHONIA NEAR CANTERBURY.—We have received an interesting communication from Miss Minnie G. S. Jellie (aged nine years), who is the proud captor of a specimen of *Argynnis lathonia*, which she took in a clover field near Canterbury on August 6th of this year. The capture is verified by her father, Mr. W. Harvey Jellie.—JOHN T. CARRINGTON; August, 1884.

LYCÆNA ARION.—I feel quite certain that the haunts of *Lycæna arion* at Bolthead must be looked upon as a thing of the past. I visited the old familiar spots twice this year, 28th June and 5th July, without seeing a single specimen. It is now more than twenty years since I first became acquainted with *L. arion*. My first record in the 'Entomologist' of my capture of thirty-six in one afternoon is in vol. ii., p. 295; and when I look back and remember the spot then, and what it is now, it is no wonder that they have disappeared. When I first visited the place the fern, furze, and thyme held full possession of the slopes towards the sea; all, comparatively, have gone. The farmer who rents the ground has annually burnt the furze, &c.; first one spot and then another. This no doubt is the principal cause; but we must also take into consideration the great assistance the elements have

given to their extermination during the past seven years. On the 17th June, 1865, when I captured the above-named species, the wild thyme was in full bloom; the fragrance of the flowers, and the aromatic odour arising from running over the plants, made a lasting impression on me. Many females I watched that day, and since, flitting about depositing their eggs on the flowers of the thyme. But now all is changed; for on the 5th inst. I could have carried all the flowers of the thyme I saw at Bolthead in my waistcoat pockets, and found no inconvenience from the quantity. Although the eggs are laid on the flowers of the thyme, and the larvæ feed upon them until the first moult, it is quite certain that it is not their food-plant; but what the food-plant is I am not prepared to state, but I strongly suspect it is one of the small trefoils or a vetch. I know *L. arion* has been on the wing this year, for I have had the pleasure of seeing nine specimens, taken during the first week in July by a gentleman who had visited Bolthead, but gave it up in disgust. He will not give the locality, for he says the place is so small that one greedy collector would clear off the lot in a couple of seasons; but if they should spread over the place in a year or two he may be induced to name the locality, but not until then.—G. C. BIGNELL; Stonehouse, July 25, 1884.

SECOND BROOD OF *SMERINTHUS POPULI*.—Having procured some larvæ of *Smerinthus populi*, I fed them on poplar till about the second week in June, when they should have pupated. Only one, however, reached the chrysalis state; the others, being stung by ichneumons, died. Looking in my pupa-cage on July 2nd I was surprised to see a perfect specimen had emerged, being only a chrysalis six weeks. Would some of your readers tell me if this, with the Sphingidæ, is of common occurrence, or only exceptional? I should be much obliged.—A. E. HALL; Norbury, Sheffield.

[It is by no means uncommon to have second broods of *Smerinthus populi*. By feeding larvæ liberally in a warm greenhouse some time ago I reared three broods in one year.—J. T. C.]

ACRONYCTA ALNI.—I have had three larvæ of this insect given me in the last few days: one was sent by post from Grantham, and two were picked up here in this village; one on a gravel path, the other at the entrance of a rabbit-hole. The first

mentioned I am sorry to say died the day after its journey. My getting three specimens in the same season may be merely a piece of good luck, or it may be that the insect is more plentiful than usual this year.—ARTHUR MARSHALL; Egginton, Burton-on-Trent, August 9, 1884.

CRYMODES EXULIS IN UNST.—I have to record the capture of a dozen fine specimens of *Crymodes exulis* at sugar, between July 22nd and August 5th; all males, and very varied. I will send a notice of other captures later in the season.—EDWIN R. CURZON; Baltasound, Shetland, August 7, 1884.

LEPIDOPTERA IN THE FENS.—I have again taken in the fens some lovely specimens of *Senta ulvæ*, though only two of the variety *wismariensis*, which seems very scarce compared with the other forms of this species. *Nonagria brevilinea*, *N. neurica*, *Leucania obsoleta*, *Meliana flammea*, *Macrogaster arundinis* (larvæ and pupæ), *Sericoris doubledayana*, *S. micana*, *Argyrolepis schreibersiana*, *Schænobius mucronellus*, *Crambus paludellus*, *Gelechia morosa*, *Chauliodus illigerellus*, *Adela sulzella*, and *Gelechia palustrella* were all more or less abundant; and from larvæ which I took of *Plusia orichalcea* I reared some fine specimens. The nights were usually perfect for collecting: I have hardly ever seen more moths about. The hot weather lately has been bringing out second broods of species which are seldom seen twice, except in such a summer.—GEO. W. BIRD; Hurley Lodge, Honor Oak Park, S.E., August 19, 1884.

COLLECTING NEAR CHARMOUTH.—With a view of working fresh ground, I went last July to Charmouth, Dorsetshire; and although the country is pretty enough, and promised to yield good species, my success was but very moderate. It is true that there were only two fine days in the three weeks I stayed there, but want of success must not be solely attributed to the indifferent weather. The winding lanes extend in every direction, bordered by hedges, in which there is a profusion of vegetation, and the Lepidoptera are thus spread over a large area, and are not sufficiently localised to admit of a large number of any one species to be readily collected. Among the Geometræ, *Melanippe rivata* was common enough, but *triangulata* and *galiata* occurred but sparingly. *Anticlea rubidata*, *Emmelesia affinitata*, *E. alchemillata*, and *E. decolorata*, *Lobophora sexalata*, *Larentia olivata*,

and *Cidarias prunata*, *C. picata*, and *C. immanata* were also taken; besides one or two of the variety *conversaria*, *Boarmia repandata*, and other common species. It was among the smaller species of Lepidoptera that I had hoped to be successful. *Ephippiphora signatana* occurred pretty freely among blackthorn, but was difficult to get quite perfect; by dint of careful working I managed to get a nice series. The larvæ of *Eupæcilia atricapitana* were feeding in the terminal shoots of a species of ragwort, which I have not yet identified; and from these I bred some very richly coloured specimens, having the ground colour of the fore wings deep peach-colour. *E. hybridellana* was common. Other species of Tortrices which occurred were *Ditula semifasciana*, *Penthina gentiana*, *P. marginana*, *Euchromia purpurana*, *Sciaphila perterana*, *Olindia ulmana*, *Semasia rufilana*, *Catoptria cæcimakulana*, *Trycheris mediana*, *Argyrolepis zephyrana*, *Conchylis inopiana*, &c. Among the Tineæ I took *Psychoides verhuella*, *Gelechia inopella*, *Ecophora flavifrontella*, *Acrolepis granitella*, *Gracilaria stigmatella*, *Coleophora fabriciella*, *C. alcyonipennella*, *C. lixella*, *C. discordella*, *C. therinella*, *C. troglodytella*, *C. hemerobiella*, and *C. frischella*. This last was fairly common on a large bed of *Melilotis officinalis*, but I quite failed to find cases. Doubtless the larvæ leave the food-plant when about to pupate. Altogether I noted some 119 species of Macro-lepidoptera, and 113 species of the Micros. I did not sugar, so the number of Noctuæ was small. *Tapinostola bondii* occurred, but not in quantity. I boxed, yet lost, a perfect variety of *C. inopiana*. It was an entirely black female. She appeared sluggish in the extreme; permitted me to thoroughly inspect her at my leisure, as she sat on a grass stem, and to box her. In this latter operation I unfortunately included a piece of the grass. Upon opening the box, the veriest trifle to remove this, heigh, presto! out went the black *inopiana*. A friend who was with me made a futile effort to net it, but we both marked it down in some long grass within a yard of us. I searched, I smoked into the grass till I emulated the moth as regards the colour of my face, I tried various other expedients, but I never again saw the melanic beauty. My friend was visibly affected, and I returned a sadder man. This would have made the fourth decent variety I have taken this season. In my garden I took the darkest *Melanippa fluctuata* I have seen; and near home a pretty variety of *Antithesia*

pruniana, particularly silky in appearance, with white fore wings delicately mottled with pale grey; also a *Scoparia* having white fore wings, with a dark brown central fascia on each. In Kent I have also taken a fair series of *E. curvistrigana* and some fine *Catoptria æmulana* from golden rod.—A. B. FARN.

ABUNDANCE OF MICRO-LEPIDOPTERA.—The present dry and warm season has been very favourable to the development of the Micro-Lepidoptera, and some species have been more numerous than for many years past. I have reared a rather large series of both *Coleophora maritimella* and *C. artemisiella* from larvæ obtained on the Essex coast, and a few *C. therinella*; also a large series of *C. argentulella* and about a score of *C. inflatella* from larvæ collected in Surrey; and *C. genistæcolella* from larvæ on *Genista anglica* in Epping Forest. The cases of *C. lutipennella* on the oak were in greater numbers than I ever saw them before.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., August 13, 1884.

THE BLUE BEETLE IN ESSEX.—This destructive beetle—the true *Phædon cochleariæ*, Fabr.—has made its appearance, I believe for the first time, on the mustard crops in our Essex marshes. It has completely cleared part of a crop on Mr. John Page's Nazewick farm on Foulness Island, and is very destructive on a twenty-seven acre marsh of Mr. J. T. Gale's, on Hollywell, on the other side of the Crouch. Mr. Page's seed came from Cambridgeshire and he blames this for the introduction of the pest; its destructive habits there and elsewhere have lately been referred to (Entom. xiv. 44, 187, 236, 294; xv. 23, 213).—EDWARD A. FITCH; Maldon, August 23, 1884.

REVIEW.

'The Entomologist' *Synonymic List of British Lepidoptera*. Compiled in conformity with the law of priority. By RICHARD SOUTH. 1884.

I HAVE to thank the publishers of the 'Entomologist' for sending me a copy of this list, and I beg to congratulate the compiler upon the successful completion of his work.

Doubleday's list has long been out of print, and Staudinger and Wocke's 'Catalog' had rendered it obsolete. For the

present generation of British lepidopterists South's list will worthily fill the place occupied by Doubleday's in the past.

Omitting accidental visitors, Mr. South enumerates 1982 indigenous species, distributed as follows:—

| | Species. | | Species. |
|-------------------|----------|------------------|----------|
| Rhopalocera . . . | 65 | Pterophori . . . | 37 |
| Sphinges . . . | 39 | Crambi . . . | 83 |
| Bombyces . . . | 111 | Tortrices . . . | 245 |
| Noctuæ . . . | 324 | Tineæ . . . | 720 |
| Geometræ . . . | 280 | | — |
| Pyralides . . . | 78 | | 1982 |

The Nycteolidæ (*Sarothripus*, *Earias*, and *Hylophila*), are placed at the head of the Bombyces; in the same group are included the Drepanulidæ, the Pseudo-bombyces of Guénée and Doubleday's List, and the Noctuo-bombycidæ or Cymatophoridæ (*Thyatira*, *Cymatophora*, and *Asphalia*). *Diloba* and *Asteroscopus* are relegated to the Noctuæ; the former to the Bombycoidæ, the latter to the Xylinidæ. The Aveniæ, Boletobiidæ, Herminiidæ, and Hypenidæ are classed as Noctuæ, at the end of the group. The Pterophori are placed between the Pyralides and the Crambi, the erstwhile Elachistid, *Chrysocorys festaliella*, being put at the head of them. *Choreutes* and *Symæthis* are ranged as Tortrices, between the Grapholithidæ and Conchylidæ. The Psychidæ are retained amongst the Tineæ.

Thus, the separation of the Dicranuridæ, Pygæridæ and Notodontidæ from the Bombyces, and the promotion of the Geometræ above the Noctuæ, are both abandoned, and the arrangement again becomes very much what it used to be, *Consule Planco*, with the solitary exception that, instead of forming the rear-guard of the order, the Pterophori are interposed between the Pyralides (ending with *Acentropus*) and the Crambi (beginning with *Chilo*). This location of the Plume-moths is the striking feature of Mr. South's classification; it was, I believe, first suggested by Dr. Knaggs, and others have noticed the affinity between *Acentropus* and *Agdistis*, to which *Chrysocorys* has manifest relationship: as Curtis said, "this moth is closely allied to the Pterophori."

On the whole, the sequence in Mr. South's List appears to me more natural than that in Doubleday's.

Of course the entomological aspect of the Catalogue is the principal thing. But I am glad that the author has not allowed

himself to think that attention to accessories can be dispensed with. There is abundant evidence that Mr. South has viewed his subject with an entomological and orthographic eye. And I therefore make no apology for asking him to take note of the following trifles, as doubtless a second edition of his list will at no long interval be called for.

There are very few generic synonyms given, only about three dozen in all; and such as there are might very well be omitted. It would be a great improvement if an external margin were allowed for the generic names, instead of printing them on the same level with the specific names; the latter have a margin, as well as distinctive type, to separate them from the synonyms; the generic names should commence as much to the left of the specific names as the latter do to the left of the synonyms.

As a rule, the names are followed by an abbreviation of the name of the author supposed to be responsible for them, but without any reference to the work in which the family or genus is founded or the species described. It strikes me that, for the familiar and generic names, the original nomenclator is not always the one whose abbreviation follows the name; but having no books at hand I cannot now verify this. A good many of the family-names are without any author's name at all; it would have been no detriment if all of them had been left without. In a few instances the name of the author has been omitted in the case of a generic or specific name, as *e.g.* the genus *Hedya* (p. 23; should it not be *Hedia*?), and *Pædisca ratzeburghiana* (p. 25; is the *h* required?).

The family-names are for the most part formed on a uniform principle. But *Brephides* (p. 11) is an exception, and it may be doubted whether *Amphidasydæ* (p. 12) and *Botydæ* (p. 18) are right; *Pieridæ* (p. 1) and *Phycidæ* (p. 20) should be *Pierididæ* and *Phycididæ*; but, on the other hand, *Chrysocorididæ* (p. 18) seems to me to be a mistake (even if *Chrysocoris* were right). *Steniidæ* (p. 18) and *Galleridæ* (p. 21) are probably nothing more than misprints for *Steniidæ* and *Galleriidæ*. If *Ennomos*, *Ephyra*, and *Zerene* sink as synonyms, the families should no longer be called *Ennomidæ* (p. 11), *Ephyridæ* (p. 13), or *Zerenidæ* (p. 14).

The generic name *Aporophyla* occurs twice: once in the *Apameidæ* (p. 6), and again in the *Hadenidæ* (p. 9). And can it be that Heinemann's *Doryphora* (p. 33) has priority over the

Coleopterous genus of that name? Has an insignificant Gelechiid rendered the Colorado-beetle nameless? I do not know the date at which that part of 'Die Schmetterlinge Deutschlands und der Schweiz' was published, but it cannot be more than about fifteen years since, whereas Illiger's 'Doryphora' dates from 1807.

Mr. South has been careful to make the adjectival specific name agree, for the most part, in gender with the specific name. A few cases, however, have escaped his attention. Thus, we ought to have *Trochilium apiforme* and *crabroniforme*, *Sciopteron tabaniforme* (p. 2), *Notodonta trilopha* (p. 5), *Asteroscopus nubeculosus*, *Heliothis dipsaceus*, *scutosus*, *peltiger* and *armiger* (p. 10), *Biston hirtarius*, *Amphidasys strataris* and *betularis* (p. 12), *Bupalus pinarius* (p. 14), *Platyptilia isodactyla*, *Amblyptilia tæniodactyla*, *Mimeseoptilus bipunctidactylus* (p. 19), *Semioscopus avellanellus* (p. 28), and *Hyponomeuta 20-punctata*, &c. (p. 30).

If Mr. South had been right in his spelling of *Chrysocoris* (p. 18), that name would have been masculine. But the proper name is *Chrysocorys*, and it is so spelt by Curtis, both in Ent. Mag., i. 191, and Brit. Ent., pl. 663.

In forming a Latin word from a Greek root, the Greek *ei* is represented by the Latin *i* (not *ei*); but this rule has not been uniformly adhered to. To be consistent, we ought to read *Deiopia* (p. 3), *Chimatobia* (p. 14), *Lioptilus* (p. 19), *Idophasia* (p. 31), and *Telia* (p. 33).

In forming a compound of two Latin words, the letter *i* is the euphonious and proper connective. Thus, we ought to write *costistrigalis* (p. 11), *rosicolana* (p. 23), *fasciipennella* (p. 35), *binotipennella*, *ardeipennella* (p. 36), and *emberizipennella* (p. 39). Where the compound is formed of two Greek words, the letter *o* is the proper conjunctive. Thus, we ought to write *Phibalopteryx* (p. 16) and *tæniodactyla* (p. 19).

Mr. South is not averse to the correction of misspelt names, and I am glad to welcome him as one of those who think that misprints should not be perpetuated. Even the law of priority has however failed to induce him to adopt *Zenzera* for *Zeuzera* (p. 4); and Banks, Francillon, Yeates and Geoffroy have still to be content with the truncate honour of *bankia*, (p. 10), *francillana* (p. 28), *yeatiana* (p. 32), and *geoffrella* (p. 34). But surely *Epione paralellaria* (p. 11) should be *parallellaria*; *Cnemidophorus*

and *Mimeseoptilus* should take the place of Wallengren's *Cnæmidophorus* and *Mimæseoptilus* (p. 19); *ophthalmicana* (p. 25) should be *ophthalmica*; *Dicrorampha* (p. 27) should be *Dicrorrhampa*; *vaculella*, *cochylidella*, *tapetzella*, and *lapella* (p. 29), should be *vacculella*, *conchylidella*, *tapetiella*, and *lappella*.

Again, *chrysonuchellus* (p. 20) should be *chrysonychellus*, and *betuletana* (p. 23) should be *betuleta*. Whilst *lafauriana* (p. 21) and *demaryella* (p. 39) would look more like Latin if they were spelt *lafauriana* and *demariella*.

In addition to the Corrigenda mentioned at the end of the List, I take the following to be unintentional misprints:—*pinistri* (p. 6) for *pinastri*; *siterata* (p. 16) for *siderata*; *rubortibiella* (p. 21) for *rubrotibiella*; *flavicillana* (p. 28) for *flaviciliana*; *heegeriella* (p. 38) for *heegeiella*; *saliciella* (p. 39) for *salaciella*; and *nacilia* (p. 40) for *naclia*.

But these minute blemishes detract little or nothing from the credit that is justly due for the preparation of "the new Doubleday"; and British Lepidopterists owe much to Mr. South for the pains he has taken in performing a somewhat thankless task.

There was a time when the Entomological Society of London contemplated the production of a co-operative 'Catalogue of British Insects,' and though a beginning was made, for ten years nothing has been done. Is it too much to hope that the appearance of Mr. South's List will stimulate the Society, and induce it to proceed with the Lepidopterous portion of its larger Catalogue, the need of which is by no means superseded by the publication that I have now the pleasure of commending to all to whom these presents come.

J. W. DUNNING.

August 18, 1884.

NOTICE.—THE 'ENTOMOLOGIST' LIST OF BRITISH LEPIDOPTERA.—Until the completion of the present volume of the 'Entomologist,' the nomenclature used in the 'Doubleday List' will be continued. In and after January next, with the commencement of Volume xviii., the nomenclature and arrangement of the new 'Entomologist' List will be followed, with reference to the British Lepidoptera, both in the Magazine and Exchange Column.—JOHN T. CARRINGTON (Editor).

THE ENTOMOLOGIST.

VOL. XVII.]

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[No. 257.]

RANDOM NOTES ON NEW ZEALAND LEPIDOPTERA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

DURING the past summer H.M.S. 'Espiègle' was employed for nearly four months cruising on the coasts of New Zealand, when she visited many of the principal ports and harbours of the colony; this enabled me to make several excursions into different parts of the country, a brief description of which may perhaps be of interest to the readers of the 'Entomologist.' I may, however, at once remark that, on account of the short stay at most of the places visited, and the prevailing wet and boisterous weather experienced, my observations were necessarily of a limited nature, and my captures not very numerous.

We first called at the little township of Russell, situated at the head of the Bay of Islands. The approach to the anchorage is very fine. For several miles we passed up a bay studded with small islands clothed with a rich verdure of scrub, with a few scattered trees on their highest points. The mainland on each side and beyond is hilly, rugged, and wooded, and at this time of the year (December 9th) was beautifully green.

Russell, although a small place, is one of the oldest "townships" in the colony; but it is likely to become of more importance, as coal-mines, which have recently been discovered and placed in good working order, are already attracting the attention of various steam-ship companies.

Soon after we anchored I went on shore with two of my mess-mates for a walk, and, as is the custom with most Englishmen when landing for the first time in a strange country, we made for

the top of the nearest hill, about a mile off, and some four or five hundred feet high. Our path took us through thick "Ti-tree" scrub (*Leptospermum scoparium*), which grew everywhere, and was only varied in the gullies, where other trees and shrubs, and magnificent tree-ferns, flourished luxuriantly. Near the town, where the land had been cleared some years ago, there was a quantity of furze, sweet-briar and thistles, which in many places have quite overrun the country and become almost as great a nuisance as the introduced sparrows and sky larks, which have increased and spread with such marvellous rapidity. It was a windy cloudy afternoon but with occasional gleams of sunshine. The only butterflies noticed were *Chrysophanus salustius*, which were disporting themselves in a sheltered nook where sorrel (*Rumex*) was growing plentifully. This species is usually found in stony waste situations where a dwarfed form of *Rumex* abounds, and upon which I believe its larvæ are nourished. A few small Geometræ and Tortrices were dislodged from the bush, but the undergrowth was so reeking with moisture from the recent rains that it was difficult to do much collecting.

The next morning we got under way and steamed for a few miles up an arm of the bay, and anchored off a place called Opuā, where there is a wharf to which coal is brought down by rail from the Kawakawa mines. It was a dull day, with strong wind and frequent showers; but at one time it cleared up and looked more promising, so I landed on the beach and made my way to a likely-looking gully about half a mile off. Here a little stream ran into the harbour, and on each side of it there were some cattle-tracks leading into the bush. I selected one which ran parallel to the stream, but after walking for about a quarter of a mile the path came to an end and I found it impossible to advance beyond, as a number of old trees which had fallen across the gully effectually prevented further progress, and the bush on each side was far too thick to penetrate. Rain also began to fall again in torrents, and my net soon became perfectly soaked and useless, so I had to retrace my steps and return to the ship. Geometræ and Pyrales were fairly numerous, and had the weather been dry I might have taken a good number. Most of my captures were quite new to me, and for the names of those given I am indebted to my friend Mr. R. W. Fereday, who very kindly presented me with a liberal collection of named types of New

Zealand Lepidoptera when I met him at Christchurch a few weeks later. The most abundant species was the pretty little *Acidalia mullata*, which occurred freely among the "Ti" bush, and which subsequently turned up at every other place we visited. It varies so much that in a series of twelve there are scarcely two alike. I have also taken it in Tasmania and New South Wales, so it appears to be widely distributed. Upon the trunks of old trees three species of *Scoparia* were common—*Scoparia feredayi*, a very distinct species, and two others which are at present unknown to me. Among sedge and rushes by the side of the stream *Botys flavidalis*, *B. notata*, and two plumes, *Platyptilus repletalis* and *Aciptilus monospilalis*, were not uncommon, and besides these I boxed about two dozen other species, amongst which were some pretty and interesting Crambites.

From Russell we proceeded to Auckland, where we remained for nearly three weeks; as it rained more or less the whole time we were there I was able to do next to nothing in the way of collecting. From thence, after stopping a day or two at Tauranga, we went on to Port Chalmers, the port of Dunedin, where we arrived on January 12th, and left again on 24th; and the weather here was much the same as at Auckland, and nothing could be done. On January 25th we reached Lyttelton, the port of Christchurch, and where, I am glad to say, we were favoured with finer weather. Lyttelton is snugly and prettily situated at the foot of a lofty range of hills in a little bay within an almost land-locked harbour. The hills slope up immediately from the back of the town, and are divided by deep gullies, in which there is a mixed growth of trees and shrubs; and the spurs and higher parts are overgrown with tufts of the native tussock grass. Little streams course down the gullies, and after heavy rains become much swollen and form waterfalls in many places; and their margins are fringed with a variety of ferns—*Asplenium*, *Todea*, *Lomaria*, &c.; and many beautiful parasitical species, such as *Asplenium flaccidum*, *Hymenophyllum*, *Polypodium*, &c., clothed the trunks of the dead and fallen trees.

One of my first expeditions was a scramble up one of these gullies to the top of the highest hill, and a more enjoyable afternoon I have seldom spent. Under the shadows of the trees, in the deepest recesses, masses of shrub-like nettles three to four feet high grew in large patches; and one of the first insects

I noticed was a battered female *Pyrameis gonerilla* depositing her eggs upon the young shoots; and a little search disclosed an abundance of larvæ of all sizes, from tiny individuals just hatched to those full grown and ready to pupate, besides a plentiful supply of chrysalids. I was of course delighted to make the acquaintance of this fine species in all its stages, and to be able to note its habits, which are almost identical with those of *Pyrameis atalanta*. The first thing the young larva does as soon as it is hatched is to fasten the edges of a tender leaf together so as to form a little tent, from which it issues forth from time to time to feed. As it grows older it increases the size of its tent by appropriating larger leaves, and when full-grown it spins a pad of silk to the midrib of the leaf which forms the roof of its tent, and from this suspends itself and changes to a chrysalis, when it hangs snugly protected from every change of weather. Some of the nettles were so devoured that the larvæ had literally been eaten out of house and home, and were wandering disconsolately about the plants. Where there was plenty of food they only appeared to move a short distance from their tents to feed, and as soon as the leaves near them were consumed they changed their quarters and constructed a new domicile. The chrysalids were so easy to find that I only boxed a small number of larvæ for the purpose of description.

I was much interested in reading Mr. Hudson's life-history of this species in the 'Entomologist' (xvi. 217), and am surprised that he should have been unable to find the chrysalis; but this I think may be accounted for by the fact that in the locality where Mr. Hudson took his larvæ they were, comparatively speaking, scarce, and were feeding upon a stunted form of nettle, so that the chrysalids could not be so easily seen; whereas in the gullies near Lyttelton the larvæ occurred in such numbers upon plants—or rather shrubs—from three to four feet high, and the tents in which the chrysalids were hanging were generally on the highest part of a stem and so conspicuous, that they could often be detected without any difficulty directly one glanced towards the spot.* These butterflies, as Mr. Hudson remarks, are very

* As my description of the larva differs slightly from that of Mr. Hudson (whose acquaintance I subsequently had much pleasure in making at Wellington), I will give it briefly here:—Length 1·6 to 1·8 in. Cylindrical, tapering towards each extremity, and with the median segments much thickened. Head slightly notched

strong and rapid flyers, and may frequently be seen careering at a headlong pace miles from any place where their food was likely to occur; and indeed they have often flown on board ship when we have been a great distance from land. Although so strong on the wing, they are bold and fearless in their habits, and when struck at and missed often return and fly backwards and forwards until captured; and I have even taken them between my finger and thumb as they sat on a leaf.

The nettles they live on near Lyttelton, as before mentioned, are tall bushy shrubs with tough woody stems, and leaves with highly developed urticating powers, being furnished with strong stinging spines arranged upon their upper surface along the ribs; and the stems also are thickly armed with the same, so that it was painful work collecting the larvæ, &c., with naked hands, for upon this occasion I did not happen to have a pair of gloves with me.

(To be continued.)

COLEOPTERA AT SHIERE.

BY EDWARD CAPRON, M.D.

A SHORT account of some of the less common Coleoptera taken in this neighbourhood during the present year, may perhaps interest a few of your readers. On the whole beetles have been anything but plentiful, and I never knew a season

on the crown, deep greenish black, blotched and speckled with black and white dots, and sparsely covered with short fine black hairs. Dorsal area hoary black, irrorated with yellowish white dots; subdorsal stripe somewhat interrupted, pale greenish yellow, bordered below by a blackish stripe, which is thickly irrorated with minute yellow dots; spiracles black, in a greenish yellow ring, and bordered above by a somewhat oblique yellow stripe and below by a wavy stripe of the same colour; ventral surface and claspers much wrinkled, pale green, tinged with yellow, with indistinct yellowish white dots, and emitting a few fine light-coloured hairs; ventral claspers tipped with a reddish fringe; short dorsal spines on 4th to 11th segments; a row of subdorsal spines, and a spine above and below each spiracle, those below seated upon a pale peach-coloured blotch; all the spines pale green, and finely branched, the subdorsal row being the longest. These larvæ vary slightly, some having the yellow-green stripes more or less suffused with golden green; others the dorsal area greenish yellow, with reddish brown blotches; and some with the spiracular region beautifully tinged with pink and pinkish yellow. I bred more than 130 splendid butterflies from the larvæ and chrysalids taken near Lyttelton, and in no case were any of them ichneumonated.

before when beating the herbage has produced so little. This has been particularly the case with the Curculionidæ and Elateridæ, even the commonest species being in many cases entirely absent. Towards the end of February I took a fine specimen of *Euryporus picipes*, out of some moss growing on a bare chalk hill, near a plantation; and in tufts of a coarse grass near the same place *Evæsthetus scaber* occurred in plenty. I soon after captured a pair (the sexes) of *Stilicus fragilis* in some rotten fern covering roots stored for the winter, but diligent searching failed to procure more. I should not have perceived these had not the red thorax betrayed their presence, as they tightly rolled themselves up and feigned death on being disturbed. All the other species of *Stilicus*, except *S. geniculatus*, are more or less common here. Amongst some hedge rubbish *Lithocharis obsoleta* and *L. ochracea*, and one example of *L. fuscula*, taken flying. In haystack refuse *Heterothops dissimilis* and *H. binotatus*, *Quedius scintillans*, *Oxypoda hæmorrhœa*, and *O. umbrata*. At the end of March I found *Mycetoporus lucidus* tolerably abundant by shaking moss in a fir plantation, and by sweeping a hedge *Balaninus villosus* and *Bledius subterraneus* were procured. In May a nice example of *Ocypus fuscatus* obligingly walked across the high road, and in June I beat a pair of *Magdalinus barbicornis* out of a hawthorn hedge. A small pool in a wood furnished me with both sexes of *Liopterus ruficollis*, and out of moss half submerged on the banks I captured several specimens of *Tachys bistriatus*, as well as *Myllæna brevicornis* and *M. elongata*. A sand-pit during the season has afforded several examples of *Tachinus elongatus*, also sparingly *Gnathoncus rotundatus*, *Lathridius testaceus*, *Colon brunneum*, *Oxypoda mutata*, *Ocalea castanea*, and a dozen *Calodera umbrosa*. Among insects taken casually I may mention *Atomaria ferruginea*, *Colon zebei*, and *Corticaria cylindrica*; also *Ips. quadripunctatus* in decaying mangold roots, *Falagria thoracica* in sand, and *F. sulcatula* in wet moss.

I have managed to take as well as see the beautiful *Cicindela sylvatica*, but found it no easy matter.

Up to the present time I have come across very few of the Phytophaga, the only ones worth recording being *Luperus flavipes* and *L. circumfusus*, *Lema puncticollis*, and *Lamprosoma concolor*.

A short visit to the Isle of Wight, the second week in June,

was rendered unproductive by the severe cold which occurred at that time, scarcely an insect being seen. I however obtained *Anisodactylus pæciloides* at Bembridge, and *Aëpus marinus* and *Philonthus sericeus* near Ryde; also a few maritime *Homalotas*, *Tachyusa uvida* and *sulcata*.

When the intense heat set in, beetles entirely disappeared, and for the last month I have taken nothing except one *Ilyobates nigricollis* in a sand-pit.

Among other insects the following may also perhaps be worth notice as having occurred in this neighbourhood:—*Badister sodalis*, not very uncommonly; *Bledius opacus*, in plenty; one or two *Prionus coriarius*, *Agrilus angustulus* and *laticornis*, *Corymbites bipustulatus* and its variety with entirely rufous elytra; *Myrmedonia humeralis* and *limbata*; *Hydrobius strigosus*, by sweeping in the evening; *Coccinella oblitterata*, in fir plantation; *Homalium pygmæum* and *iopterum*, *Læmophlæus ferrugineus*, *Salpingus castaneus* and *Lissodema 4-pustulata*, *Mordellistena lateralis* was very plentiful during the summer, and varieties occurred almost entirely ochraceous. I have once taken here, also, a single example of *Agathidium confusum*, Bris.

Shiere, Guildford, August 19, 1884.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*).

ANOMALON, *Jur.* (including *Agrypon*, Först.)

- A. Antennæ from half to three-fourths the length of the abdomen (male and female).
- a. Posterior discoidal recurrent nervure (fore wing, fig. 2, *q. r.*) interrupted by anal nervure (*r. t.*) in or a little below the middle.
- * Forehead with a horn just above the antennæ.
- † Scape of antennæ entirely yellow. - 5. *bellicosum*, 5—6 lines.
- †† Scape of antennæ yellow beneath.
- ‡ Abdomen red; apex and back of 2nd segment black; hind coxæ black. - - - - - 1. *xanthopus*, 5—6 lines.
- †† First segment and back of 5th to 7th black; hind coxæ red, extreme base black. - - - - - 4. *ruficorne*, 5—6 lines.
- ** Forehead without a horn; joints of hind trochanters of equal length below.
- § Scutellum convex, or slightly depressed.

- × Forehead with a vertical ridge above the antennæ.
perspicuum, 5—6 lines.
- × × Forehead without a vertical ridge, or with a very slight one.
 - o Exterior discoidal recurrent nervure interstitial.
 - Antennæ black, scape with whitish spot beneath.
Base, apex, and back of 2nd segment of abdomen black.
8. *fibulator*, 7—8 lines.
 - → Antennæ rufo-fulvous; abdomen red, with a black line on 2nd segment. - - - - - 3. *mirabile*, 14 lines.
 - oo Exterior discoidal recurrent nervure not interstitial.
 - → Face yellow; hind femora black, or base and apex red.
6. *cerinops*, 5—9 lines.
 - ++++ Face of male yellow, female sometimes yellow-marked; base of hind femora black. - - - - - 13. *latro*, 6—9 lines.
 - §§ Scutellum depressed, margins very much raised.
Agryp. canaliculatum, 4—5 lines.
- b. Posterior discoidal recurrent nervure interrupted by anal nervure above the middle.
 - * Transverse anal nervure divided by a more or less distinct emitting nervure.
 - † Hind tarsi not thickened; thorax black.
 - † Exterior discoidal recurrent nervure interstitial.
 - § Antennæ about half the length of the insect. 9. *perspicillator*, 5 lines.
 - §§ Antennæ three-fourths the length of the insect.
cylindricum, 7—8 lines.
 - †† Exterior discoidal recurrent nervure not interstitial.
10. *tenuitarsum*, 5 lines.
 - †† Hind tarsi thickened.
 - × Exterior discoidal recurrent nervure interstitial.
7. *melanobatum*, 6—6½ lines.
- × × Exterior discoidal recurrent nervure not interstitial.
12. *clandestinum*, 3—4½ lines.
- ** Transverse anal nervure not divided.
 - o Hind coxæ red.
 - Vertex black.
 - → Breast yellow, or yellow-marked; 1st to 3rd segments of abdomen reddish chestnut, with bases black. - 11. *interruptum*, 6¾ lines.
 - ++++ Breast not yellow-marked; back and sides of apex of abdomen black.
anxium, 4½—5½ lines.
 - → Vertex with yellow spots; thorax of female greater part red; apex of abdomen slightly fuscous.
arquatum, 3½—5½ lines.
 - oo Hind coxæ black.
 - ∞ Aculeus about as long as the 1st segment of abdomen.
minutum, about 2¼ lines.
 - ∞ ∞ Aculeus about half the length of the 1st segment.
 - ! Exterior discoidal recurrent nervure almost interstitial.
septentrionale, 3 lines.
 - !! Exterior discoidal recurrent nervure not interstitial.
 - * Hind tibiæ red, apex dark. - *Agryp. flaveolatum*, 3½—6 lines.
 - ** Hind tibiæ black, towards the base red. - *anomelas*, 4—5 lines.
 - c. Posterior discoidal recurrent nervure not interrupted.
geniculatum, 3 lines.

B. Antennæ as long as, or a little longer than, the insect; hind tarsi not thickened (male and female).

a. Base of 1st segment, sometimes back of 2nd and 3rd, generally 6th and 7th, black; back of 4th and 5th piceous.

Agryp. tenuicorne, 3—6½ lines.

b. A line on back of 2nd segment and three apical segments of abdomen black. - - - - - 14. *gracilipes*, 5½ lines.

This very characteristic genus is rich in species; and from their great similarity of coloration, together with the variability of many species in size and colour, they require careful discrimination. Besides Gravenhorst, Wesmael's "Revue des Anomalous de Belgique" (Bul. Ac. Brux., xvi., ii., 115–139), and Holmgren's "Ophionidsläget *Anomalon*" (Öfversigt, &c., xiv., 157–186, pl. ii.) and "Monographia Ophionidum Sueciæ" are the authorities to consult; but there are also many scattered descriptions. Foerster's genus *Agrypon* is acknowledged in Marshall's catalogue, but is here included with *Anomalon*, as the distinctive characteristics are not only trivial, but frequently inconstant, the principal difference being the absence of the horizontal nervure from the transverse anal nervure. Wesmael rightly describes this as sub-obsolete in *A. clandestinum*. *Atrometus*, Foerst., also appears to be a superficial genus. Of the fourteen *Anomalous* and three *Agrypons* included in Marshall's catalogue, *A. capitatum*, Desv., is omitted, as being hardly a true *Anomalon*; and we know nothing further than Curtis's very short and mostly colour description of his *A. gracilipes*; it is probably only a pale variety of the common *A. tenuicorne*, Gr. To these are added *A. arquatum*, Gr., *A. anomelas*, Gr., *A. perspicuum*, Wesm., *A. anxium*, Wesm., *A. septentrionale*, Holmgr., *A. geniculatum*, Holmgr., *A. cylindricum*, Bridgm., and *A. minutum*, Bridgm. (see Trans. Ent. Soc. Lond., 1881, p. 157; 1883, p. 164; 1884, pt. iii.). *A. xanthopus*, *bellicosum*, *cerinops*, *melanobatum*, *fibulator*, *tenuicorne*, *perspicuum*, and *canaliculatum* are well figured on plates 3 and 43 of Vollenhoven's 'Pinacographia.' The species of *Anomalon* are solitary in their parasitism, and emerge direct from the pupa of their host, not spinning a separate cocoon like most of the Ophionidæ. They are exclusively parasitic on Lepidoptera, being mostly attached to species whose larvæ do not spin a cocoon, as the Noctuæ, Geometræ, and Tortrices.

The following British species have been bred:—

1. *xanthopus*, *Schr.*, from *Pieris daplidice*; Bignell. *Fidonia piniaria*; (Bernuth) Ratzeburg. *Trachea piniperda*; Ratz., (Graff) Ratz., (Muss) Ratz., Boie, Brischke, Bridgman. *Miselia oxyacanthæ*; Brischke (*armatum*). *Cucullia lychnitis*; Giraud. *Halias quercana*; (Reissig), Ratz.
4. *ruficorne*, *Gr.*, from *Callimorpha dominula*; *Gir.* *Demas coryli*; Boie.
5. *bellicosum*, *Wesm.*, from *Sphinx pinastri*,* *Demas coryli*; Brischke.
6. *cerinops*, *Gr.*, from *Eupithecia* sp.; Brischke. *Diloba cæruleocephala*; (Graff.) Ratz. *Agrotis segetum*; Brischke. *Tæniocampa gracilis*; (Perris) *Gir.* *Calocampa vetusta*; Brischke.
8. *fibulator*, *Gr.*, from *Bombyx castrensis*; (Goossens) *Gir.* *Diloba cæruleocephala*; *Gir.*
9. *perspicillator*, *Gr.*, from *Cnethocampa pityocampa**; (Perris) *Gir.* *Simyra nervosa**; Brischke.
10. *tenuitarsum*, *Gr.*, from *Zygæna filipendulæ*, *Z. lonicæræ*; Weston. ? *Diloba cæruleocephala*; (Dale) Curtis.
12. *clandestinum*, *Gr.*, from *Hemithea thymiaria*; Bignell. *Emmelesia alchemillata*, *Eupithecia lariciata*, *E. actæata**; Brischke. *E. veratraria**; (Goossens) *Gir.* *E. castigata*; Bignell. *E. linariata*; Barrett. *E. pumilata*, *E. absynthiata*, *Ypsipetes impluviata*; Raynor. *Cenectra pilleriana*, *Hyponomeuta evonymella*, *Cerostoma radiatella*; Brischke. *C. costella*; Bignell.
13. *latro*, *Schr.*, from *Diloba cæruleocephala*; Brischke.
perspicuum, *Wesm.*, from *Cleora lichenaria*; Atmore. *Noctua*; *Gir.*
1. *flaveolatum*, *Gr.*, from *Thecla betulæ*; Bignell. *Hybernia defoliaria*, *Eupithecia actæata**; Brischke. *Notodonta dromedarius*; Marshall coll. *Thyatira batis*; *Gir.*, not Drewsen and Boie, teste Ratz. *Acrobasis consociella*; (Goureaux) Dours. *Halias prasinana*, *Earias clorana*; Brischke. *Tortrix heparana*; Ratz. *Hyponomeuta evonymella*; Brischke, *Gir.*
2. *tenuicorne*, *Gr.*, from *Thais polyxena*; Bignell, ? Ruthe coll. *T. rumina* var. *medesicaste*, *Doritis apollinus*; *Gir.* *Euchelia jacobææ*; (Fallou) *Gir.* *Selenia lunaria*; Elisha. *Anisopteryx æscularia*; Bignell. *Dicranura bifida*; (Richter) Grav. *Cymatophora or*; Brischke. *Dianthæcia capsicola*; Bignell. *Anarta myrtili*; Brischke. *Hyponomeuta padella*, *H. malinella*,* *H. evonymella*; (Goureaux) Dours.
3. *canaliculatum*, *Ratz.*, from *Fidonia piniaria*; (Graff) Ratz. *Halias prasinana*; Brischke. *Pædisca sordidana*; Sang. *Steganoptycha rufimitrana*; Walsingham. *Hyponomeuta evonymella*; Ratz., Brischke.

- arquatum, *Gr.*, from *Tæniocampa gothica*; Bignell.
 anxium, *Wesm.*, from *Teras hastiana*; (De Graaf) Voll. *Eupœcilia*
 udana; Elisha.
 septentrionale, *Holmgr.*, from *Pœcilocampa populi*; Raynor.
 geniculatum, *Holmgr.*, from *Cynips kollari* galls (probably ex *Ephippi-*
 phora obscurana); Weston. *Halias clorana*;
 Vollenhoven.
 cylindricum, *Bridgm.*, from *Euchelia jacobææ*; Fitch coll.
 minutum, *Bridgm.*, from *Chrysocorys festaliella*; Fletcher.

TRICHOMMA, *Wesm.*

- A. Scutellum yellow-marked, or black; aculeus one-third of abdomen.
 1. *enecator*, 4—5 lines.
 B. Scutellum red; aculeus one-fourth of abdomen.
 2. *fulvidens*, 7—7½ lines.

T. fulvidens appears to be very rare; there is one female in the British Museum from Desvignes' collection. *T. enecator* is not uncommon, and is apparently exclusively parasitic on Tortricidæ; we have bred it from *Tortrix* pupæ received from Lord Walsingham, whose larvæ had fed on *Myrica gale*. Vollenhoven records that Heylaerts bred it from a *Tortrix*; and in Ruthe's collection there is a specimen bred from a willow-feeding *Tortrix*. Brischke records it from *Earias clorana*; it emerges direct from the *Tortrix* pupa without spinning any cocoon. Details of both species are well figured in Vollenhoven's 'Pinacographia' (pl. 43, figs. 8, 9).

GRAVENHORSTIA, *Boie.*

Black; head and thorax yellow-marked: scutellum yellow; apex of abdominal segments yellow-banded; legs yellow, varied with black and red; head cornuted; exterior discoidal recurrent nervure interstitial; transverse anal nervure divided; aculeus slightly exserted (male and female). - - - - - *picta*, 8—11 lines.

This oft described, but distinct and beautiful, species is not mentioned in Marshall's catalogue. In the Proc. Ent. Soc. Lond., 1872, p. xlv., we read:—"Mr. Bond exhibited a new British species of Ichneumonidæ (*Anomalon fasciatum*), bred by Mr. Mitford from the cocoons of the supposed variety of *Lasio-campa trifolii*, obtained from larvæ found at Romney, Hants" (this should be Romney Marsh, Kent). The species was first described by Drewsen and Boie as *Gravenhorstia picta* (Wieg. Archiv., ii., 43; 1836. Kröy. Nat. Tids., i., 311; 1837), from specimens bred from *Bombyx trifolii* on May 26th. Dr. Giraud

described it under Schæffer's MS. name, *Anomalon fasciatum* (Verh. z.-b. Gesell. Wien, vii., 170; 1857), from specimens in the Vienna Museum, bred from the south-east European variety *Spartii* of *Bombyx quercus*. Mr. Marshall described the specimens bred by Mr. R. Mitford under Smith's same MS. name (*A. fasciatum*, Ent. Mo. Mag., ix., 240; 1873); there are two males and one female in the National Collection. Taschenberg described a Spanish female as *Ophion septemfasciatus* (Zeits. Ges. Nat., xlv., 428; 1875), but considered it the type of a new genus. Dr. F. Rudow has described it as *Anomalon pictum* (Ent. Nach., viii., 35; 1882). We have a female and the large eggar cocoon from which it was bred by Sir Sidney Saunders in Corfu, it has emerged direct from the *Bombyx* pupa. Both sexes are well figured in Vollenhoven's 'Pinacographia' (pl. 3, figs. 1-2 *b*); the male from Drewsen's original specimen and the female from one caught in Holland; the *Banchus*-like coloration is very striking.

RANNOCH IN JUNE.

BY A. H. JONES.

To the entomologist resident in the South of England I cannot imagine a more delightful excursion than one to Rannoch, for, in addition to the novelties in the way of species, nearly all the specimens he meets with differ to some extent from the forms with which he is so familiar. For the collector of Tortrices I cannot recommend a better time than the last half of June, as I think the following account will testify.

As accommodation elsewhere was difficult to obtain, I stopped at Kinloch, and found it in some respects better than Camachgouran (where I have usually taken up my quarters), and nearer some of the best collecting ground for mountain species; moreover, Rannoch Moor, on the edge of which Camachgouran is situated, is now closed to entomologists. The first day's collecting, June 15th, was devoted to the Black Wood. How it is changed! Large fir trees lay in every direction, in some places two or three together. This dreadful devastation was the result of the storm which destroyed the Tay Bridge. On this one night, I was told, 2000 trees were blown down, a number it could ill afford to lose.

On the occasion of this visit to the Black Wood I only met with *Phoxopteryx myrtillana*, which was, however, common among

Vaccinium. From June 15th to 20th I worked chiefly in a plantation of young Scotch fir, paying occasional visits to the hills about 500 feet above it. Among the firs I met with *Coccyx cosmophorana*, not uncommonly flying throughout the day. I also took on the wing in the afternoon sunshine a fine series of *Mixodia rubiginosana*, *Retinia pinivorana*, and five *R. duplana* (northern form of *turionana*?); also one *Stigmonota coniferana*. In the swampy places between the fir trees *Penthina dimidiata* and *Phoxopteryx uncana* were not uncommon, and *Clepsis rusticana* occurred occasionally. *Eupæcilia ciliella* was in great abundance in certain localities. On the hills, flying in the afternoon sunshine among *Arctostaphylos uva-ursi*, I took a fine series of *Euchromia arbutana*, *E. mygindana*, and *Coccyx nemorivagana*. The last-named species occurred equally among heather, and I should not be surprised to find this to be also its food-plant. Among heather *Mixodia schulziana* and *Phoxopteryx unguicula* were both common. *Penthina prælongana*, an abundant Rannoch species, still lingered a little way up the hill-sides among birch. *Phlæodes tetraquetra* also occurred among birch, and *Grapholitha campoliliana* among willow. The last visit I paid to the Black Wood was on June 24th, and on this occasion I took flying round the branches of the fir trees a series of *Coccyx coniferana*; also one *C. cosmophorana*, the only specimen I noticed in the Black Wood. Among *Vaccinium*, *Mixodia palustrana*, *Coccyx ustomaculana*, *Sericoris lacunana*, *S. irriguana*, and *S. daleana* were all more or less common. *Irriguana* is now, I believe, considered only a small form of *daleana*, and it has been suggested to me by a good authority that *daleana* is also only another form of *lacunana*, an opinion I am inclined to share.*

On June 25th, at about 2500 feet, I took a few *Penthina staintoniana* among its supposed food-plant, *Vaccinium myrtillus*; and on the same ground a few *Amphysa gerningana*. A little higher up

* Is our correspondent quite sure that he captured the true *Sericoris irriguana* in the Black Wood of Rannoch? There is a form of *S. daleana* which occurs in the Black Wood closely resembling *S. irriguana*. The latter in my experience is a truly mountain species, never being found under 1500 ft., and more frequently at 3000 ft., having quite different habits and time for flight. *S. daleana* flies in the afternoon, after the manner of many other Tortricæ; while *S. irriguana* flies high, say, six or eight feet above the ground, just before and after sunrise, and not freely in the afternoon. Will Mr. Nicholas Cooke give us his opinion? I have taken *S. lacunana* in the meadows below the graveyard at Camachgouran, and within a few hundred yards of *S. daleana*, which is apparently a bilberry-feeder.—J. T. C.

the hill, among "grey moss," *Scoparia alpina* was common. I had but little time to devote to the Macro-Lepidoptera. I noticed several *Argynnis euphrosyne* and two *Thecla rubi* in the Black Wood, and an occasional *Chortobius davus* on the moor. *Larentia salicata* occurred a little way up the hill-sides, and *Emmelesia blandiata* in the meadows near the loch. *Botys fuscalis* was in the greatest profusion in many localities. I did not sugar (which I was told was not productive), and the only Noctuae I met with were *Cymatophora* or and *Hadena rectilinea* at rest on palings.

Shrublands, Eltham, Kent, September 13, 1884.

DESCRIPTION OF AN *EUPITHECIA* NEW TO SCIENCE.

By C. S. GREGSON.

EUPITHECIA CURZONI, *miki*.

Imago.—Expands over three-quarters of an inch, wings broad. Colour of the whole insect silvery steel-gray, tinged with ochreous on parts of the wings in fine specimens. The striæ are numerous; sometimes they are obscure, at other times they are distinctly divided by sharp silvery markings, often with a broad transverse central band, composed of about three dark unequal striæ: this band is darkest at the outer edge and turns outwards to the costa; on its outer edge are a series of dark cuneiform nerve-marks pointing inwards. The discoidal spot and nerve below are well defined. The outer striæ are confused, but are edged with a well-defined wavy or arched line; the bases of the arches are outwards. Cilial line distinct, ciliæ broad, nerval-marks well defined. Under wings small, dark, striate; cilial line distinctly pronounced.

Larva.—Eggs deposited in June soon hatch, and the young larvæ are of various colours, from light ashy-green and gray to bright grass-green. Form cylindrical, long and slender; when older, form long, slightly broader at the middle segments and somewhat appressed. Colour: bright grass-green predominates; yellowish and whitish greens appear; one before me is dark green, and one chocolate-brown. Size, three-quarters to seven-eighths of an inch long; head lobed, hairy, light horn-colour; corslet, none; on its space may be seen three darkish markings, the dorsal line passing through the central one; dorsal streak well defined to fourth segment, when it broadens out into six spearhead-like

dark markings, pointing forwards, followed by a less well-defined roundish marking to the anal segment. Sometimes these spear-head-like markings appear almost lozenges. Under each of the spearheads is a dark streaky mark, placed diagonally, the wrinkled edging to which is light and well-defined; anal segment without a plate.

Pupa.—Rather obese. Face, thorax, and wing-cases bright grass-green. Anterior segments bright red-ochre colour. Spins a slight web of white silk at the base of its food-plant amongst the débris lying about, and pupates therein.

Remarks.—General appearance of full-grown larva: form long, slender, central segments broadest, slightly appressed. Colours various, from bright green to rich chocolate-brown, and with six well pronounced spear-head or lozenge-shaped dorsal markings, edged diagonally with light green. It is a rather slender, wrinkled, "pug" larva, and belongs to the *absynthiata*, *satyrata* and *knautiata* group of *Eupithecia*, but has a much more elegant appearance than these in both the larval and imago state. It is the most lineolate *Eupithecia* I know. The moth appears in plenty at Balta Sound, in Shetland, on heathy places, its larva eating *Calluna vulgaris*; it was taken there during June, 1884, by Mr. E. Roper-Curzon, from whom I have received a most liberal supply of perfect insects and the larvæ from which this description is written.

This is probably the insect figured in the 'Entomologist' (vol. xiv., plate i., figs. 2 and 3), and there supposed to be *E. satyrata* or *E. nanata* (page 303), and which was to receive future consideration. In the absence of that consideration, up to the present time, I have thought it best to wait no longer, and therefore have described the species from the long series of specimens captured and given to me by my friend Mr. Curzon. I have named it in his honour *Eupithecia curzoni*. In the arrangement of the genus *Eupithecia*, in British collections, this species should precede *E. satyrata*; but it has nothing common in appearance with that genus, except perhaps its shape; the arrangement by the larvæ as followed in France alone places it there. Following Newman's plan in 'British Moths,' of giving English names to all species before the scientific name, this will be called "Curzon's Pug."

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS DAPLIDICE AND ARGYNNIS LATHONIA NEAR ASHFORD.—Driving from hence to Sandgate on the 20th of last month, I distinctly saw a *Pieris daplidice* flitting along the road-side, and settling on the flowers of marjoram. It kept pace with the carriage for some little way, and then disappeared over the hedges. Having often seen the species in the South of France, and well knowing its look whilst flying, I do not think it possible that I could have been mistaken. On the downs above this place (Wye) *Argynnis lathonia* has been taken more than once; it seems to delight in the thistle-blossoms.—(Rev.) HENRY BURNEY; Wye, near Ashford, Kent, September 3, 1884.

COLIAS EDUSA IN SUSSEX.—Having stayed at Slindon, which is a small village near Arundel, during August and until yesterday, I should like to record that I captured a fine male specimen of this butterfly on August 8th, and during the four hot days we had last week, viz., 17th, 18th, 19th, and 20th, I saw altogether twenty-four specimens, seven of which I captured; all were flying across stubble fields.—W. H. BLABER; Beckworth, Lindfield, Sussex, September 21, 1884.

COLIAS EDUSA AT HASLEMERE.—On September 11th I observed one specimen of *C. edusa* flying very fast, in Polecat Lane, on the slope of Hindhead; it was in fine condition, and appeared to be freshly out. This is only the fourth specimen I have seen during the last four years; two at Winchester in 1881, and one here in 1882.—R. J. HUTCHINSON; Inval, Haslemere.

LYCÆNA ARGIOLUS.—Referring to Mr. Jenner Weir's interesting paper on *Lycæna argiolus* (Entom. p. 193) in which he has done me the honour to quote my description of that species from the 'Butterflies of Europe,' I may say that I have for some time past been struck by the variation in the width of the black border on the fore wings of the female. I must, however, confess that the fact of this difference being due to seasonal variations has hitherto escaped my notice, though I now call to mind that all the broadly-marked females I have taken in England have been summer captures. At the same time I recollect having twice taken the narrow-bordered form in August, once in England and once in Switzerland, so I suppose it occurs as an aberrant form of the second generation.—HENRY C. LANG; Maidenhead, Berks, September 18, 1884.

CHÆROCAMPA NERII AT EASTBOURNE.—My brother, a friend, and myself were walking along the sea front at Eastbourne, at about half-past nine on the night of the 24th September, when my attention was attracted by a large moth, which was flying round one of the electric lights. It alighted on the post, and I saw it was a magnificent specimen of *C. nerii*. I promptly placed my hat over it, and sent my brother to the house where we were staying, which was fortunately near at hand, for a net, in which we enclosed the hat, and safely captured the moth.—B. ALFORD ; 7, Pembridge Villas, Bayswater, London, W., September, 25, 1884.

CHÆROCAMPA NERII AT TOTTENHAM.—Mr. South states in the 'Entomologist' Synonymic List, that the appearance of *Chærocampa nerii* in this country is phenominal. It may interest your readers to know that the phenomenon has turned up at Tottenham. A fine but somewhat travel-worn specimen was brought to me in a tumbler, on the 12th of September, by some boys, who had found it settled on some scarlet-runners in a garden near the India Rubber Factory in this place ; the specimen is now in my cabinet. — W. B. POOL ; L.R.C.P., Tottenham, September, 21, 1884.

CALLIMORPHA HERA IN DEVONSHIRE.—This charming insect appears to have fairly taken up its abode in Devonshire ; the exact locality I would rather not name, for fear of its speedy expulsion. In August, 1882, whilst returning from my morning's collecting, in company with Mr. Willie Waring, a son of the late S. L. Waring, Esq., whose collection was well known to all old collectors, in a rather secluded part of a narrow lane, I observed *Callimorpha hera* flying between our heads, then dashing into the fence, much to our disappointment ; but patience and perseverance soon made our new insect a prisoner. Six days afterwards, while beating in a new locality, one was started and secured, to our great sorrow a worn specimen. The following year two were taken, one on a low myrtle bush, and the other flying in the sun in the garden where the myrtle grew, a distance of half a mile from where the first two were taken in 1882. A third was found just over the garden fence, on the road, evidently having been run over by some passing vehicle, being a mutilated specimen ; this was not kept. This August, we were beating

hedges, a distance of fully three miles from where the specimens of *C. hera* were taken in the previous years, and on the fifth day of our search my young friend, Mr. Waring, beat out a good specimen, and being rather a sluggish flyer was soon safely netted and bottled. While I was in the act of pinning our first capture, my friend was busy securing a second, which he kindly gave to me; a third was taken by myself, making three good specimens in the short space of about ten minutes. The next day, being Sunday, we were leisurely walking down a lane, when by an accidental touch of the hedge one bolted across our path and was soon secured by my friend. The following evening, myself, Waring, and two lads in our rear, were returning just as it was getting dark, through a narrow lane overhung with hazel, holly, oak, ivy, and long grass, when one of the lads in our rear called out that a large insect had just flown over the hedge. In an instant it returned, was secured, and proved to be one of our finest specimens, making five altogether last August, three of which I fortunately possess. I may add that the specimens, as compared with foreign ones, are extremely large. Sugaring proved to be quite a failure.—W. BROOKS; The Lodge, The Oaks, Lower Norwood, S.E., September 11, 1884.

LEPIDOPTERA NEAR PORTSMOUTH.—I found a specimen of *Hepialus sylvinus* at rest on a tree-trunk in Stake Wood, on June 10th, 1883. In the evening, July 18th, 1884, Mr. T. Larcom, of Gosport, took a splendid specimen of *Deilephila lineata* from the jessamine in his garden. From a willow tree at Char Common, near Gosport, on August 10th, I procured a single larva of *Cymatophora ridens*, but was unsuccessful in rearing it.—W. T. PEARCE; 42, St. John Street, Buckland, Portsmouth, August 27, 1884.

LAPHYGMA EXIGUA NEAR GREENWICH.—It may be interesting to some of our metropolitan collectors to know that I took a specimen of *Laphygma exigua* at Greenwich on the evening of July 8th last. The specimen was flying at dusk about a hawthorn bush, with a short, jerky flight, and I thought at first it was a specimen of *Miana furuncula*; but was soon convinced it was something different, as it kept near the bush. Having netted and boxed it, I put it away with my other captures, but it was not until the following morning that I recognised what a rarity I had taken.—J. W. TUTT; 45, Beaconsfield Terrace, East Greenwich, September 8, 1884.

LAPHYGMA EXIGUA.—Whilst sitting at supper last evening a moth flew in at the open window to the gaslight, which I captured, and to my great surprise it proved to be a particularly fine and fresh example of *Laphygma exigua*. One would hardly have expected this rarity in one's upper room, an uninvited but very welcome guest.—W. H. TUGWELL; Greenwich, September 22, 1884.

LARVA OF GEOMETRA SMARAGDARIA.—While collecting micro-larvæ on the Essex salt-marshes last week, I took one larva of the above rarity, on a plant on which I should never have thought of looking for the species; and although I had never seen the larva of *G. smaragdaria* before, and was not even thinking of it at the time, I knew in a moment what it was, from its being covered all over with small pieces of leaves and scaly portions of its food-plant; it reminded me very forcibly of the larva of *Phorodesma bajularia*. I certainly should not have seen it, had it not stretched itself out and waved its head to and fro with a tremulous motion; for its mimicry of dead portions of its food-plant is so perfect that it took me some little time to find it after I got home, although there were only a few small pieces of the plant in the box. It is now three years since I first went after this larva, and many long and fruitless journeys I have had since that time, extending over miles of ground in every direction on the salterns. Year after year I was searching the wrong plants; for although I worked up the subject as well as possible, by all the books that contained any information at all about the species, the knowledge I gained was quite useless as regards its food, so that my journeys always ended in disappointment. They were not, however, altogether unprofitable, for I have added a great number of very local species to my collection, from larvæ taken in the district, which I certainly should never have found had it not been *Geometra smaragdaria* which first induced me to collect over such a very uninviting and desolate-looking locality. Mr. Machin, who discovered the larva in Essex some few years ago, has seen my larva, and pronounced it to be that of *G. smaragdaria*, as I thought. Now I know its food I am in hope of filling up my series, although I am inclined to think that will be no easy matter, for I had quite two hours' collecting after I had taken this larva, but failed to take another. The exact locality and the food-plant I must for obvious reasons at present decline to state, but will leave that

to be given by my friend who first found it in this country at his own time and convenience.—GEO. ELISHA; 122, Shepherdess Walk, City Road, September 18, 1884.

EPUNDA NIGRA IN PERTHSHIRE.—During my stay in Rannoch I captured a fine specimen (female) of *E. nigra* in the Black Wood. I got a male in the same locality some seasons ago. I am told that they are of infrequent occurrence in that district, so that I should like to record them in the 'Entomologist.' We have had a tolerable season in Rannoch for some insects, but not nearly as good as many summers I have spent there. Larvæ seem very scarce indeed; even many of the common kinds were hardly to be found.—ELIZABETH CROSS; Edinburgh, September 18, 1884.

THE DEATH-WATCH AND ITS SOUND. — I feel somewhat surprised by the remarks of three correspondents, seeing that within the last fifty or sixty years several reliable articles on this subject have appeared in various works. When a young lad I had in my bedroom a slight box or case made of paper (not pasteboard), in form similar to the tins generally used for packing cream, &c.; this case contained only a desiccated seed-vessel of the Stramonium. One night for the first time I heard a ticking sound much like a watch; there being no watch in the place, I thought it came from an adjoining room, but no watch was there; and having heard of "death-watches," I concluded this must be one, therefore commenced a search for it, and soon discovered the sound proceeded from the Stramonium-case. Nothing could be seen on merely looking into the box, which was then removed into another room, but, wherever placed, the ticking continued to come from the Stramonium-case; still nothing could be seen. My father suggested holding it to the fire to see if any living thing would make an appearance when the place became "too hot" for it; in a few seconds a fine female *Atropos pulsatorius* rushed out from the Stramonium in an excited state; no other creature could be found, and the ticking in the box was heard no more. I am fully convinced that the *A. pulsatorius* causes the watch-ticking sound, though at present I have not been able actually to see it perform. This insect is the *Termes pulsatorium*, Linn. = *Psocus pulsatorius*, Latr. I read that the Termites or white ants produce a sound by tapping with their mandibles. The Death-watch beetle (*Ptinus fatidicus*, Linn. = *Anobium tessellatum*, Fabr.) is a very different insect. I had read accounts of this beetle and

its sound, the descriptions being so correct that when I first heard the little rapping noise I was sure it must be the true death-watch; the sound is very distinct, and may be heard in a room where people are moving and talking; it consists of about six or eight raps in quick succession, then an interval of perhaps ten minutes, more or less, before another set of raps is repeated. The Death-watch, like most other insects, is more vigorous in warm than in cool weather; it appears about the end of May, and continues, I think, until the end of July. About forty years ago I had the opportunity to capture several of these little beetles, which I kept in small cardboard boxes, where they soon proved themselves *bonâ fide* death-watches by rapping against the inside of the box; they are very manageable and interesting insects; when allowed to come out of the box they moved about quietly, rapping at intervals under my eye; to produce the sound the insect first raises itself on its legs in a peculiar manner, and then strikes vigorously (on whatever substance it stands) with the front of the head. My *Anobiums* laid eggs from which young larvæ were hatched. It is stated that the Death-watch will respond to an imitation of their call made by tapping with the finger-nail; I am not sure that this is the case, but I really think it is a fact (from my own experience). Some time ago I heard a tapping which I presume must be made by another species of this tribe of insects, the sound not quite so loud, and the number of beats more extended—I should say double the number made by the present *Anobium*, with intervals similar. I am sorry to add that circumstances prevented my searching for the insects.—G. R. WEBSDALE; August 11, 1884.

THE DEATH-WATCH.—For the last two or three years I have spent some weeks every summer at an old farm-house at Felixstowe, generally going down in June. The house was erected, I should say, about the year 1550, and is one of those massively built old timber structures which were plentifully erected about that period. I had always been very anxious to discover the "death-watch," and consequently was delighted to hear it for the first time upon my visit to the old house in the summer of 1882. Carefully noting the direction from which the sounds came I searched for the beetles, and almost immediately found one upon a ledge of the timber. I should state the beetles generally commenced rapping at dusk, and did not keep up the sound long, as

we were seldom disturbed by them at night. Without a doubt the noise is made as a call to each other; and I proved this to be the fact by tapping with my finger-nail on the back of my watch, when I was almost certain to be immediately answered by one of the beetles. I also constantly heard two of them tapping to each other. In this manner I discovered the whereabouts, and captured several of the insects. As to the method by which the sound is produced I am able positively to set the point at rest, as I have not only watched the beetles and seen them produce it, but I have by tapping induced captured beetles to make the noise in the presence of friends, who also witnessed the performance. Upon my making the tapping the beetle would gather himself up, and appear to be intently listening. As soon as I had finished he would elevate himself on his legs, and quickly rap with his head seven or eight times upon the wood or other substance upon which he might be. The species I captured was *Xestobium tessellatum*. The sound could be distinctly heard fourteen or sixteen feet away from the insect. I kept specimens of the beetles in pill-boxes for some time, and amused my friends with sights of the performance.—E. F. BISSHOPP; 32, Museum Street, Ipswich, August 11, 1884.

PTEROSTICHUS MELANARIUS A FRUCTIVOROUS INSECT. — An intelligent gardener (Mr. Graves) of this town told me that his strawberries were devoured by a beetle, and that he had caught dozens, if not hundreds, of them by making little holes in the ground to act as pitfalls. I offered to show him some beetles, to see if he could recognise the species. After two or three bad shots amongst the *Rhyncophora* and *Sternoxi*, I showed him a box containing *Pterostichi*, &c. He pointed out *Pterostichus melanarius*, Ill., as the culprit, and declared that he was his "worst enemy" in the strawberry-bed. I disbelieved his story and said they were probably his best friends, and eat vermin in the strawberries. Next morning before breakfast he brought me a box containing a *Pterostichus melanarius*, Ill., and a strawberry with a hole in it. I was still incredulous, but could find no signs of insect-vermin inside the hole. I therefore cut off a sound piece of the strawberry, and put that and *Pterostichus* into a gallipot. During the day and evening I suddenly uncovered the pot several times, and generally found the beetle at work with his jaws, leaving decided traces on the surface of the strawberry. I

am therefore perfectly satisfied that this carnivorous insect is a fruit-eater at times. I have not yet been able to satisfy myself that *Amara spinipes*, L., feeds on the flower- and seed-heads of *Centaurea nigra*, but I have so frequently found their heads embedded in them that I shall be glad to have the observations of others. A near ally, *Zabrus gibbus*, has been seen eating wheat by Mr. Chas. Waterhouse, and perhaps by others. — A. C. HORNER; Tonbridge, Kent, July 10, 1884.

THE WILLOW BEETLE AT LYMM.—For some weeks past the willow growers in Lymm, Statham, Thelwall, and other places in Cheshire have been troubled by the appearance among their willow beds, some of which are extensive and very valuable, of numbers of beetles, which threaten to destroy all the willows in the neighbourhood, unless the means that are now being adopted, prove effectual. This beetle is a little larger than the size of a pinhead, but its powers of destruction are enormous, and the anxiety of the willow-growers can be easily imagined. A meeting was held on Monday night, in the Plough Hotel, Lymm, and was attended by several gentlemen, who conferred together as to the best means of exterminating the pest. Among those present were Messrs. H. Cameron, T. Davies, G. Leigh, G. Warburton, J. Marsh, and T. Hutchinson (who acted as secretary). A resolution which pledged all the growers to continue the use of paraffin oil, with the object of catching the beetles, was carried. By this means one grower has caught some millions in one day, and it is believed if this course is followed up the crops will be saved. Some of the beetles are now on view in the Warrington market.—‘Liverpool Weekly Courier,’ May 31, 1884.

[Mr. Thomas Hutchinson, of Warrington, has kindly forwarded specimens, which prove to be the well-known *Phratora vulgatissima*, L., as was expected. He also writes, under date 18th August, that the beetles are again very numerous and again doing great damage.—E. A. F.]

THE ‘ENTOMOLOGIST’ SYNONYMIC LIST OF BRITISH LEPIDOPTERA AND THE HAGGERSTON ENTOMOLOGICAL SOCIETY.—At a meeting of the above Society, held this evening, a discussion was held on Mr. South’s new list of British Lepidoptera, and the universal opinion was “That many of the alterations were uncalled for, and that a re-issue of the Doubleday List, with the addition of the new species discovered since the date of its

publication, would have been far more acceptable to the great body of British entomologists. It was further resolved that the above opinion be entered in the minutes, and a copy forwarded to you for insertion in the 'Entomologist,' if convenient." — E. ANDERSON, Sec.; 10, Brownlow Street, Dalston, London, E., Aug. 21, 1884.

[It would have been much more satisfactory if the members of the Haggerston Society had given their reasons for the objections they have raised in the above resolution, which might then have been answered in detail. The following remarks, however, may perhaps be worth their consideration:—It certainly is to be regretted that in the new 'Entomologist' List it was found necessary to supersede some of the names to which many of us had become accustomed, but the law of priority is inexorable, and it is only by the acceptance and adoption of the earliest names that we can insure a fixed and unchanged nomenclature. Had a reprint of the Doubleday List, with all the recent additions, been published, it could not have stood long, and would soon have been rendered obsolete by general consent. Many British entomologists have never accepted the Doubleday List; others who at first adopted it have long ceased to use it in favour of that of Staudinger. There are others who, though they have up to a recent period used Doubleday's List, are aware that many of the names given therein are not the earliest, and therefore by the law of priority legitimate, names. These have only continued to use Doubleday because, previous to the publication of the 'Entomologist' List, no attempt had been made to introduce a more uniform and at the same time stable nomenclature. It was further found that the growing desire on the part of many British entomologists to cast off their insular prejudices, and to extend their studies to the whole European insect fauna, necessitated the production of a list of Lepidoptera in which the names would be equally understood on each side of the English Channel. We have great pleasure in stating that we have received most complimentary testimony as to the value and necessity of Mr. South's really very excellent work, from many of the leading lepidopterists of this country. We therefore trust that the members of the Haggerston Entomological Society will further discuss this matter. We are sure that the exertion of learning the "new" names in this list will be far outweighed by the scientific results of such labour.—ED.]

THE ENTOMOLOGIST.

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[No. 258.

COLLECTING AT LYNMOUTH, NORTH DEVON.

BY RICHARD SOUTH.

THIS year I spent some weeks at the pretty little village of Lynmouth. This place is about six miles from Headon's Mouth, where I had stayed on former visits to North Devon. The village is said to be twenty miles from any railway station, and the usual route from London is per G. W. R. or S. W. R. to Barnstaple, and thence by coach through some splendid scenery to Lynton, a somewhat larger village, standing on the hill 500 feet directly above Lynmouth. During the summer months there are other means of approach, and the tourist has the choice of travelling from Paddington (G. W. R.) *viâ* Bristol and Minehead, and then by coach through Porlock and Countisbury; or he may book from Waterloo (S. W. R.) *viâ* Barnstaple to Ilfracombe, from which place he can next day continue his journey to Lynmouth by coach through Coombemartin and Paracombe, or by steamboat up the Bristol Channel. There is still another route open to those who enjoy a sea trip, that is from Paddington *viâ* Bristol to Portishead by train, and thence by the fine steamboat 'Lynn' to Lynmouth. The voyage is performed in from four hours and a half to six hours, according to wind and tide. This last route is most enjoyable, especially on a fine day. The varied scenery of the Somerset and Devon coasts on the south side and that of South Wales on the north side of the Bristol Channel cannot fail to afford delight to the lover of the picturesque.

Lynmouth is often, aptly, styled the English Switzerland. I must not, however, attempt to describe the beauty or grandeur of its scenery, because, apart from the fact that to do so would be foreign to the general purport of these notes, I fear that my pen would fail to draw a sufficiently vivid word-picture of such charming valleys as that of the East Lynn, or do justice to the rugged magnificence of its lofty hills.

A rough idea of the more prominent botanical characteristics of the locality is pertinent to the subject in hand. The beautiful woods, which fringe the bed of the East Lynn and cover the lower slopes of the hills on either side, are composed mainly of young oaks, with here and there a band of larch or spruce. Clumps of alder bushes and alder trees of large size grow by the margins of the stream. An occasional ash, beech, or birch, and some fine old hornbeam trees, together with an undergrowth of hazel (*Corylus*), dogwood (*Cornus*), buckthorn (*Rhamnus catharticus*), sallow (*Salix*), rose (*Rosa*), bramble (*Rubus*), honeysuckle (*Lonicera*), bilberry (*Vaccinium myrtillus*), ling (*Calluna*), and other plants, such as golden-rod (*Solidago virgaurea*), yellow cow-wheat (*Melampyrum pratense*), wood-sage (*Teucrium scorodonia*), &c., offer food for the larvæ and refuge for the imagines of many species of Lepidoptera.

The rocky hill-sides are chiefly covered with a short springy turf, not unlike that of the downs in the South of England. Many plants, such as wild-thyme, milkwort (*Polygala*), scabious, &c., grow in great luxuriance thereon. Large clumps of furze are scattered about, many of which must have existed undisturbed by man for numbers of years, judging from the height—eight or nine feet—to which some of the bushes have attained. The rocks are clothed with various mosses and lichens, and on some of them are patches of stonecrop (*Sedum*). Where the ground is very stony or much broken the foxglove abounds, and in some of these places wormword (*Artemisia absinthium*) is plentiful; dog-violet and strawberry are both abundant; so also is the wild-madder (*Rubia peregrina*) in particular spots.

Although many species of Lepidoptera were abundant in the larval stage at Lynmouth during the first fortnight of June, but few imagines of any species were to be met with until the 15th of the month. This state of things was without doubt due to the retarding influence of dry cold easterly winds, which had prevailed in the district for some considerable time previous to my arrival

there. During the latter part of June and the first ten days of July, however, the weather was all that could be desired from an entomological point of view, albeit agriculturists hardly entertained the same opinion. Farmers were anxious for rain; the ground was parched, and all kinds of vegetation was seriously affected with Aphides. The sea-fogs that from time to time rolled over the land were of little benefit to the crops. There was no heavy rain until the 28th of June; then the following two days were showery, and there was a slight fall of rain with distant thunder on the 3rd of July, and a few showers again on the 11th, the day I left Lynmouth.

During the time I was at Lynmouth I saw or captured some two hundred species of Lepidoptera; of this number about twenty-seven species were in the larval stage.

Anthocharis cardamines was not seen until the 10th of June. I have noticed before that this species appears scarce on the North Devon coast, but it was even scarcer this year. On the same date *Argynnis euphrosyne* was still out and in fine condition; also a few *A. selene* were met with. The last-named species was not well out until the 15th of June.

Several larvæ of both *Argynnis aglaia* and *A. paphia* were found hiding among the herbage on the banks by the road-side on the 12th of June. These were fed up on dog-violet, and disclosed imagines after my return to London.

A specimen of *Eurymene dolobraria* was found at rest on the trunk of a large oak tree near Waters-meet. I had not hitherto seen this species in North Devonshire.

Boarmia repandata var. *conversaria* occurred frequently, and one or two of those secured were very beautiful.

Corycia temerata and *Abraxas ulmata*.—I had not met with either of these species in North Devon before. The last-named was abundant in places along the East Lynn valley. I did not meet with a variety; and with the exception of being a little larger in size and perhaps a trifle brighter they were otherwise much the same as specimens I have from other parts of England.

Ypsipetes elutata.—Of this very variable species I obtained a remarkable series from larvæ found feeding on bilberry and heather. I also bred a series from larvæ found and fed up on sallow. As has been before noticed in these pages, the uniform lesser size of the specimens obtained from bilberry and heather

is a noticeable feature, but the greater extent of variation of both colour and pattern of marking of such specimens is even more striking. I cannot think that food has much to do with the matter. This question of food as a factor in the coloration of Lepidoptera and its influence—if any—in causing variation is one that I cannot well enter into here. I hope shortly to return to this subject in a paper on protective coloration of Lepidoptera.

Melanippe tristata.—New to me in North Devon. Several specimens, together with *M. montanata* and *M. galiata*, disturbed from the bushes, &c., growing on stone walls. In a former paper (Entom. xiv. 155) I have referred to the North Devonshire walls. They are the only kind of boundary used for fields, &c.; and the bountiful and varied vegetation which adorns their sloping sides and crowns their summits affords excellent harbour and sustenance for many species of Lepidoptera. I captured and examined a large number of *M. montanata*, with the result of obtaining a nice series of interesting forms.

Anticlea badiata.—One specimen in good condition on June 11th. This is the latest date I have ever observed this species on the wing.

Cidaria russata.—Some examples of this species were captured as late as June 20th. Many of them were not, however, in the best possible condition; at the same time they were not by any means worn out. From four females taken between June 16th and 20th I obtained batches of eggs, from thirty-eight to fifty-two in a batch, or an average of forty-two deposited by each female. These all duly hatched, and the larvæ were fed on rose and strawberry at first; but on my return to London I added young leaves of sallow to their bill of fare. The boxes containing these batches of eggs were each marked with one or other of the first four letters of the alphabet in the order of capture. Considering the batches A, B, C, D were deposited and also hatched within a day or so of each other, the broods of larvæ, although supplied with the same food and subjected to exactly identical circumstances in every respect, evinced great disparity in the rate of feeding up, both in the broods collectively and in individuals of the same brood. Brood A from the first was much further in advance of B, C, D than the slightly earlier date of birth would seem to warrant. Again, the specimens bred from A larvæ are larger than any yet bred from either of the other broods. On the

other hand, the D brood were the slowest growers, and so far have produced only imagines much smaller than either A, B, or C; whilst at this present date (September 17th) seven larvæ are still feeding. It will be seen from the following table that twenty-nine imagines from the A larvæ emerged from August 17th to 23rd, thus completing their metamorphoses in about sixty-two or sixty-three days. I should mention that at the later date (August 23rd) two larvæ of brood A were still feeding.

Table showing the rate of emergence of the imagines of four broods of *Cidaria russata*, reared from eggs deposited between June 16th and 20th.

AUGUST.

| | 17th. | 18th. | 19th. | 20th. | 21st. | 22nd. | 23rd. | 24th. | 25th. | 26th. | 27th. | 28th. | 29th. | 30th. | 31st. |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A | 3 | 4 | 4 | 5 | 3 | 6 | 4 | | 1 | 1 | | | | 1 | |
| B | | | | 1 | | | 1 | 4 | 2 | 2 | 2 | 2 | | | 1 |
| C | | | | | | 2 | 3 | 1 | 2 | 1 | | 1 | | 3 | 1 |
| D | | | | | | | 1 | | | | | | | | |

SEPTEMBER.

| | 1st. | 2nd. | 3rd. | 4th. | 5th. | 6th. | 7th. | 8th. | 9th. | 10th. | 11th. | 12th. | 13th. | 14th. | 15th. | 16th. | 17th. | Remaining. |
|---|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|---------------------|
| A | 1 | 1 | | | 1 | | | | | | 1 | | | | | | | Nil |
| B | 1 | 1 | | | | 1 | 2 | 1 | | | 1 | 2 | 2 | 2 | 1 | 3 | | Some pupæ & 6 larvæ |
| C | 1 | 4 | 1 | | 1 | 1 | | 2 | | | 1 | 2 | | 1 | 1 | 1 | | Eight pupæ |
| D | 1 | 1 | | 1 | 1 | 2 | 1 | 1 | | | 1 | | | 1 | | 1 | | Some pupæ & 7 larvæ |

Cidaria suffumata.—I took several specimens of this species during the latter half of June; but the capture of a fine and perfect specimen on July 4th was a great surprise.

I did not try the attractive power of sugar, so my captures in Noctuæ were only of such species as I could net at dusk or meet with at rest, and certain others of which I found larvæ. The only species in this group worthy of note is *Toxocampa craccæ*, of which I obtained a few larvæ from the locality where I took it in 1881 and 1882. *Vicia sylvatica*, the food-plant of this species, occurs sparingly on the rocky cliffs close to Lynmouth on the west side of the river. I also noticed some large patches of the vetch among the brambles in the "Tors," near the Lyndale Hotel, Lynmouth. No signs of larvæ having fed on the plant were observed in the latter place, but plants on the cliffs showed evident traces of larval attentions; and the way in which the leaflets were cleared from the stems was very suggestive of the neat kind of work performed by larvæ of *T. craccæ*.

I understand that "sugaring" is nightly practised in the Tors woods by sundry entomological visitors during the months of August and September, but I have not yet seen any account of work done in that locality during those months. If any reader of these random notes has tried autumnal "sugaring" in any of the woods about Lynmouth, perhaps he will kindly give us the benefit of his experience.

Larvæ of *Botys asinalis* were beaten from madder (*Rubia peregrina*). These were nearly full-fed when found (June 19th), and soon spun up in the angle formed by the top and rim of lid of the tin box in which they were confined.

Phycis adornatella was very abundant on the sides and the top of the Tors, also in the Valley of Rocks, Lynton, at the end of June. I found some larvæ of a *Phycis* feeding on thyme, or rather they were in a long silken mine on the ground among the twigs of thyme, at Headon's Mouth, in 1881. These produced *P. subornatella*, Zell.

Some forty species of Tortrices were captured, among which were *Dichelia grotiana*, taken very sparingly under oak trees in the "Tors" and in the valley of East Lynn. *Spilonota rosæcolana*.—A few. *Orthotænia striana*.—Very common in a rough field called Westlands; this species gets on the wing about 7.30 p.m. *Pædisca occultana*.—A few beaten out of larch. *P. sordidana*.—Found larvæ of this species feeding in folded leaves of alder during June; the perfect insects are now emerging. *Ephippiphora turbidana*.—I got very few of this species this year; the food-plant was abundant in one or two fields a little beyond Lynn Vale, and distant from Lynmouth about one mile and a half; curiously enough, though, I did not get a single example of the insect where its food was plentiful; but by the side of the Barnstaple highroad, where there were a few dust-covered plants, I got all the *E. turbidana* brought back with me this year. *E. signatana* was scarce among blackthorn; so also was *Olindia ulmana* among bilberry, &c., under larch trees. *Stigmonota redimitana* was represented by two specimens only; I have taken as many dozens in about an hour at a place called Trentishoe Bottom, near Headon's Mouth. *Eupæcilia rupicolana* was fairly common among *Eupatorium* near the sea, and very fine and bright specimens most of them were. *Argyrolepis cnicana* was not uncommon; but only one specimen of *Conchylis smeathmaniana* was met with.

I was fortunate enough to capture eight beautiful specimens of *Ecophora lambdella*, six of which were taken in one evening between 7 and 8 o'clock.

12, Abbey Gardens, St. John's Wood, London, N.W.

September 17, 1884.

RANDOM NOTES ON NEW ZEALAND LEPIDOPTERA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(Continued from p. 221.)

In the gullies, in addition to the numerous beds of nettles, there was a thick undergrowth of mixed rank vegetation, and as one walked through it was astonishing to note the vast quantities of Pyrales of different species that were disturbed. The most abundant was *Botys flavidalis*, an insect much resembling *Scopula ferrugalis*, only a trifle larger, and given to variation; whereas *S. ferrugalis* is usually constant in its markings and coloration. Two others—*Botys notata*, also much like *S. ferrugalis*, but with a conspicuous yellowish white discoidal spot on the fore wings, and an unnamed species—were almost as numerous; while *Deana xanthialis*, *Botys deprivalis*, *Deraba cordalis*, &c., occurred commonly. Beating the lower branches of trees produced *Larentia megaspilata*, *L. invexata*, and one specimen of the beautiful *Cidaria purpurifera*; besides *Helastia indicataria*, *Acidalia undosata*, and many others at present unknown to me. Proceeding further up the gully the trees became less numerous, and gave way to tussock grasses and patches of *Iris* sp. ?; and here *Cidaria inclarata*, one of the most abundant of New Zealand Geometers, was a perfect pest. It varies a great deal, and several very pretty varieties were secured. The tussock grass was also the home of many Crambites,—*Crambus flexuosellus*, *C. vitellus*, and *Chilo leucanialis* being the most frequent; *Camptogramma subochraria*, *Acidalia rubraria*, *Larentia semisignata*, and *Cidaria clarata* were taken in the same situation.

On reaching the summit of the range of hills, which is divided into several peaks, of which Mount Pleasant, 1642 feet, is the highest, a magnificent view of the surrounding country was

obtained. Below on one side was Lyttelton, just like a chess-board, with its streets laid out at right angles to each other; and H.M.S. 'Espiegle' and other ships in harbour so reduced by distance that they looked mere pigmies; while on the other side the celebrated Canterbury plains could be seen stretching away for miles and miles, until the eye rested on the New Zealand alps in the far distance; and Christchurch, which was seven or eight miles off, seemed close beneath. The ground here was extremely rough, being covered with huge blocks of stone, between which tussock grass grew in dense tufts. In some places, where it had to a certain extent been cleared, there were numerous beds of thistles, which were in profuse bloom, and upon which many *Pyrameis gonerilla* were feasting, while others flew about and sported with each other in the fresh breeze. After resting for a short time and enjoying the fine view I descended the hill by another route, and went on board much pleased with my afternoon's work.

On January 30th I left Lyttelton by an early train for a place called Whitecliffs, a little hamlet about forty miles beyond Christchurch, where I stopped for a couple of days for the purpose of fishing the River Selwyn. After leaving Christchurch the railway crossed the Canterbury plains and passed through an immense tract of country, which at this time of the year was chiefly under wheat. Some of the fields are more than a hundred acres in extent, and the various crops appeared to be in a very flourishing condition. Where not under cultivation the country was overgrown with the usual tussock grass, and there was not a single tree or bush to be seen, except near farmhouses, where Australian gum trees had been planted to form a shelter from the prevailing winds, and were a pleasing break to the otherwise monotonous landscape.

On reaching Whitecliffs I found the river very high and discoloured by the recent rains and melting snow from the neighbouring mountains, so that fishing was quite out of the question. Luckily the weather was delightfully bright and warm, so I devoted myself almost entirely to Entomology.

The first butterfly I saw was the curious *Argyrophenga antipodum*, which was just coming out and was in splendid condition. The males appear to be the first to emerge, for during the day, although several hundred butterflies were seen,

only one female was taken. It was a great pleasure to make the acquaintance of this strange species,—one I had often read and heard of, and longed to see. Its flight and general appearance are quite unlike that of any other species with which I am acquainted. The males fly in a weak, sailing, flapping manner a few feet above the tussock grass, and go away in a perfectly straight line for a considerable distance before they alight. The moment the sun becomes obscured they all disappear, settling on the tussock grass and crawling down the stems towards the base of the plant, when they turn head upwards and sit on a stem until the sun shines again. They cease flying altogether after four o'clock; and after that hour, or earlier in the day when the sun is obscured, they were frequently to be seen at rest on the grass. The newly-emerged butterflies seem to take longer flights than those which have been out for some time. Occasionally they settled on flowers to feed; but flowers were scarce, and there were not many varieties to choose from, a small dandelion and a starved kind of white clover being all I noticed. It was a pretty sight to see a number of them on the wing together, for as they slowly flapped or sailed along, the silver streaks upon their under wings glittered in the bright sunshine, and made them look very interesting and attractive.

The next day the river was still high and discoloured; so after three or four hours fishing, with but poor success, I gave it up, and again turned my attention to Entomology. It was another glorious bright day with a cloudless sky, and deliciously fresh invigorating breeze which came direct from the snow-clad alps in the distance, but was not too cold or too strong to prevent butterflies from appearing. *A. antipodum* was far more numerous to-day, and a few females had emerged, but they were in the proportion of one to twenty of the males. Nor were they so active on the wing, for upon being disturbed, as one passed through the grass, they simply flew for a little distance, settled on a tussock, and tried to creep into the middle of it. *Chrysophanus salustius* was fairly common and in fine condition; and by the river's side, sitting sunning themselves upon the warm shingle, the pretty little *C. boldenarum* was plentiful, but not easy to catch, for directly it took wing it was difficult to see on account of its small size and rapid flight. Geometrae were conspicuous by their absence, the only species noticed being *Campto-*

gramma subochraria, which, on the wing, reminds one of *Aspilates citraria*; and *Hyperythra panagrata* (coming near *Fidonia*), a little moth common throughout New Zealand. However, several species of Crambites were numerous, and were to be kicked out of every tussock.

This ends my trip to Whitecliffs, for I returned to Lyttelton by the last train.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA AT NEW MALDEN.—I have much pleasure in recording the capture of this lepidopteron at New Malden, upon the 20th of September. It was seen by my neighbour, Mr. C. Andrews, sporting about some drain-pipes in his garden; he caught it with his hat and kindly presented it to me alive. It is a female, and in fair condition.—H. T. DOBSON, Jun.; New Malden, Surrey, September, 1884.

VANESSA ANTIOPA NEAR KING'S LYNN.—Early in September a fine specimen of this butterfly was captured by Sir William Ffolkes, Bart., M.P., in his own garden at Hillington. So far as I know, this is the only specimen which has been noticed this season in this neighbourhood; but it is noteworthy that whenever this species has of late years made its reappearance in this country, Norfolk especially has been favoured with its presence.—EDWARD ATMORE; Lynn, Oct. 9, 1884.

VANESSA ANTIOPA.—On September 28th I saw, but unfortunately failed to catch, a fine specimen of *Vanessa antiopa* on the Backwater Bridge, at Weymouth. After trying several times to catch it in my hat, not having a butterfly-net with me, I gave up the chase.—A. W. P. CAMBRIDGE; Weymouth College, Oct. 4.

COLIAS EDUSA AT CHRISTCHURCH.—On October 5th I took a fine male specimen of this butterfly in a garden here. It is the third I have seen there this autumn, and about half a dozen specimens were seen, but not taken, in the country near by my brothers on the 4th.—A. DRUITT; Christchurch, Hants, October, 1884.

COLIAS EDUSA IN HACKNEY.—On the 11th inst. my friend Mr. Chillingworth captured a fine female specimen of *Colias*

edusa in Lansdown Road, London Fields. It is a large specimen, measuring in the expanse of the fore wings 2 inches 5 lines. It was brought to me immediately after it was taken, and is now in the collection of the Hackney Microscopical and Natural History Society.—J. A. CLARK; The Broadway, London Fields, Sept. 11.

COLIAS EDUSA IN KENT AND ESSEX.—It may interest some of the readers of the 'Entomologist' to hear of the appearance of *Colias edusa* this year. I captured a female in The Warren, at Folkestone, the last week in August; and during the present month have seen two male specimens flying over Wanstead Flats in front of my house. I believe that in the year previous to the last "*Edusa* year" they appeared sparingly in the autumn.—J. A. COOPER; 1, Sussex Villas, Harrow Road, Leytonstone, Sept. 24.

COLIAS EDUSA AT DOVER.—While staying at Dover last August I saw a specimen of the above species, but it flew away, and I could not capture it. The next day I went to the same place, and saw another specimen, which I captured; but, being a very battered male, I did not keep it. A few days after I saw another in the same spot, but could not net it, as it flew too fast, and the ground was so rough that I stumbled once or twice.—B. B. HUNT; The Grove, Woodford, Essex, October 2, 1884.

COLIAS EDUSA NEAR MALDON.—The two species of *Colias* so frequently appear in England in hot seasons that I kept a sharp look-out for them all through August, but without even viewing a single specimen. To-day I hear from my brother, Mr. A. G. S. Raynor, that he captured a single specimen of *C. edusa* at Hazeleigh on September 9th. I fear that so late in the season we are not likely to see them in any numbers, but it will be interesting to hear if the species has been observed elsewhere in England this autumn. Since writing the above I saw two specimens of *C. edusa*, on September 16th, a very bright and warm day, winging their way leisurely along the banks of the Great Eastern Railway line between Maldon and Witham. *Vanessa cardui* has appeared in considerable numbers in Essex this season, but I have not noticed any other species of butterfly in unusual quantities.—(Rev.) GILBERT H. RAYNOR; Shenfield, Brentwood, September 16, 1884.

COLIAS EDUSA AT THE LAND'S END.—On October 4th I took two specimens of this insect, and saw numbers of them flying over

the grassy slopes, in very good condition. This insect is usually plentiful here during the months of August and September, the season of 1882 alone proving an exception, in which I did not take one. The cliffs having a southern aspect are most favoured; but on account of their steepness a close pursuit is not always practicable.—R. J. ANDERSON; Porthauxno, Penzance, October 8.

POLYOMMATUS PHLÆAS BRED.—I have succeeded in breeding some very fine specimens of *Polyommatus phlæas* from ova deposited by females captured on August 2nd. They emerged from September 19th to the 22nd. The larvæ were fed on a growing plant of sorrel; and from the same batch of ova I have now some very small larvæ feeding, and others nearly full grown.—J. A. COOPER; 1, Sussex Villas, Harrow Road, E., September 24, 1884.

ACHERONTIA ATROPOS IN THE CENTRE OF LIVERPOOL.—On the 2nd inst. a boy brought to me an *Acherontia atropos*, which he had taken in a bacon shop in Elliot Street, where no vegetables or potatoes are sold, in the centre of Liverpool. — B. COOKE, jun.; 21, Renshaw Street, Liverpool, October 4, 1884.

CHÆROCAMPA CELERIO IN BERKSHIRE.—I yesterday received from a lady residing at West Hannay, near Wantage, Berks, a living specimen of *Chærocampa celerio*, which she found in her greenhouse. It reached me alive and in fine condition. Hannay is so entirely an inland place that it is evident the moth must have been bred in England. — W. SLADE; 131, Elizabeth Street, Cheetham, Manchester, October 2, 1884.

DEILEPHILA LINEATA AT BRIGHTON.—I had the pleasure last autumn of receiving from a correspondent, Mr. Parsons, of Cavendish Street, Brighton, a fine specimen of *Deilephila lineata*. It was taken at Bevingdean by Master Rake, of Brighton College, on July 10th, 1883. — J. A. CLARK; The Broadway, London Fields, September 11, 1884.

ACRONYCTA ALNI.—On August 31st I found a full-fed larva of *Acronycta alni* crawling on a fence at Wildernes Park, near Sevenoaks. It has since eaten its way into the cork at the top of a zinc collecting box, and changed to a pupa.—LEWIS F. HILL; 3, Edwardes Terrace, Kensington, W.

CURIOUS HABIT IN LARVA OF ACRONYCTA PSI. — A few days since I placed in a breeding-cage a full-fed larva of *Acronycta psi*.

At the back of the cage was some virgin cork, in which was the cocoon of *Mania typica*, from which the moth emerged in June last. The *Acronycta* larva entered this cocoon, and in about two minutes returned to the opening with some of the skin of the old pupa in its mouth and threw it out; this it repeated once or twice, then attaching a web to the valve or trapdoor of the cocoon hauled it up as one would a drawbridge, and so closed itself in.—ROBT. M. WATTSON; Narford Rd., Upper Clapton, Sept. 9, 1884.

NOTODONTA TRITOPHUS AT SOUTHWOLD.—In looking over a small collection of Lepidoptera, taken early this season at Southwold, I saw a male specimen of *Notodonta tritophus*. I am told it was taken flying to the light of a shop window.—E. G. MEEK; 56, Brompton Road, S.W., October 6, 1884.

LAPHYGMA EXIGUA IN NORTH DEVON.—Whilst rambling over one of the hills at Lynmouth, North Devon, on September 3rd, I was fortunate enough to disturb from the heather a small Noctua, which after flying a few yards settled again, and enabled me to capture it with a small box, as I had no net with me. Upon bringing it home and submitting it to my friend Mr. Wellman he at once pronounced it to be *Laphygma exigua*, and in very fair condition. I searched for more, but was not successful in finding any.—W. WEST; Cyprus Villa, Lewin Road, Streatham Common, S.W., October 6, 1884.

LAPHYGMA EXIGUA AT CROSBY.—On September 16th I took, at a lamp in Crosby, a Noctua which was unknown to me. I subsequently identified it as *L. exigua*. Mr. Gregson verified it, and says that it is a very well-marked specimen and an addition to the Lepidoptera of the district.—GEO. A. HARKER; 28, Brook Road, Blundellsands, Liverpool, Oct. 15, 1864.

NONAGRIA SPARGANII, *Esp.*—Amongst some moths captured for me at Deal by my mother, at the beginning of September, there was a species of *Nonagria* unknown to me at the time, and I find on reference to the European Collection of the British Museum that it turns out to be the above-mentioned insect. The specimen was taken flying at dusk in a garden in Park Street. It is the insect recently discovered in this country by Mr. Sydney Webb.—R. MELDOLA; October 18, 1884.

CHAREAS GRAMINIS. — Yesterday morning, whilst crossing Kersal Moor, I noticed an unusual fluttering in the centre of a

large tuft of hair-grass (*Deschampia flexuosa*), which grows abundantly on the moor, mingled with the common heather, now in full flower. I soon found that an unusually fine female *Charæa graminis* was reposing, whilst several males flew in uncertain gyrations round her; others were scurrying post haste to the spot, attracted by the same cause, and the whole scene resembled exactly what so often occurs amongst the Bombyces; but I was unaware till now that the female *C. graminis* possessed similar powers of attraction. This moth has not been observed by me in this locality before. It is, however, abundant this year, not only here, but also in my field and grounds at Prestwich, not far distant, and no doubt generally so in the neighbourhood; but it is, I believe, a moth extremely capricious and uncertain in its appearance, and may not be seen at all next year.—J. COSMO MELVILL; Prestwich, August 23, 1884.

ABNORMAL ABUNDANCE OF AGROTIS SEGETUM.—Throughout the season I have noticed the unusual plenty of imagines of *Agrotis segetum* in this district, and especially has this been noticeable from the middle of August to the present time, when it has invariably put in its appearance at sugar in considerable force. Moreover, during the last month or so agriculturists have been complaining of the injury done to the turnip crop by the “grub.” Having asked one of them for a few of these “grubs,” I very soon received a number of larvæ of this species in various stages of development; also pupæ. In some localities the crow, with unerring instinct, has been making short work of this “undesirable tenant of the soil.” The condition of imagines observed at sugar within the last few days would indicate their recent emergence; and, judging of the number of full-grown larvæ and pupæ now met with, there will probably be no lack of the moths so long as moderately warm weather continues.—EDWARD A. ATMORE; King’s Lynn, September 22, 1884.

ENTOMOLOGICAL JOTTINGS FROM CHICHESTER. — Almost the first emergence in my breeding-cages this season was a fine male *Endromis versicolor*, bred from a batch of Scotch eggs, obtained from Mr. McArthur in May of last year. This specimen made its appearance on February 14th, and was the only one that came out. The remaining cocoons still feel heavy, so that I hope they will give me some moths next year. On the same day a *Notodonta dictæa* was in the cage, and a few days later, and

during March, *Platypteryx unguicula* furnished me with a good series. On March 22nd I bred a melanic variety of *Stauropus fagi*—a male; on April 4th, a dark female; and on the 8th and 15th, two more fine dark females emerged in perfect condition. The male insect was unfortunately rubbed in coming out of the pupa; this misfortune I obviated with the others by damping the moss in which the cocoons were placed. Perhaps I may be allowed here to express my somewhat tardy thanks to Mr. Jobson, for his kind instructions relative to the “breeding *Stauropus fagi*,” contributed in answer to a query of my own, to the ‘Entomologist,’ vol. xvi., p. 211. Having so few cocoons I was afraid (no doubt foolishly) to trust them out of doors as he directed; had I done so I might not have failed with one even. I may observe that the moths were not forced, being kept in a cool room. The first week in May, *Dianthæcia capsophila* came out, and on the last day of the month the first *Smerinthus ocellatus*, a male, showed himself. On June 14th, a specimen of *Acherontia atropos* was captured in the park. Towards the close of the month *Sesia tipuliformis* was observed, flitting over the currant bushes in the garden. About this time the formidable-looking stag-beetle (*Lucanus cervus*) was to be seen in some numbers. In July the handsome larvæ of a sawfly, bright blue-green, with the first and last segments orange, with rows of black spots, were in great profusion on willows (*Salix alba*), stripping the trees almost bare of leaves, the leaves also being much disfigured with a rosy gall. During this month the pretty Geometer, *Anticlea rubidata* (with *Iodis vernaria*, *Melanippe procellata* and *Cidaria pyraliata*) was to be beaten out of hedges, or taken “in the gloaming” fairly common. On the 21st July a fine *Acherontia atropos* emerged, the larvæ being found in September of 1883. Sugaring has not produced much; but amongst swarms of *Apamea oculea* I may mention *Plusia chrysitis* (over nettles), *Orthosia ypsilon*, *Mania maura*, *Tryphæna janthina* and *interjecta*, *Catocala nupta*, *Pyralis glaucinalis*, *fimbrialis*, &c. On July 14th I took a female *Zeuzera æsculi* in the garden. She has deposited a number of eggs. Should there be anyone desirous of breeding this insect, I shall be very happy to forward them. Early in August *Ennomos fuscantaria*, bred from ova, began to appear. All the specimens are remarkably light in colour. In this month larvæ of *Smerinthus ocellatus* were taken from apple trees; and on the

15th two larvæ of *Acherontia atropos*, found feeding upon potato leaves, were brought me, nearly full-fed. The caterpillars of the gooseberry sawfly (*Nematus ribesii*) have been very troublesome this year, and we have been greatly annoyed by the attacks of the leaf-cutter bee, or bees, for both species (*Megachile centuncularis* and *Anthocopa papaveris*) may have been the guilty depredators. Not alone were the rose-leaves selected, but fuchsias were cut up almost into ribbons; and geranium-flowers (those of a salmon-colour being preferred) had large circular patches taken out of almost every petal, causing them to present a sorry figure. The first week in August another pest came to the fore, the truly disgusting larvæ of the pear-tree slug (*Selandria cerasi*). These were busy on pear trees and cherry trees, doing their best to skeletonize the leaves, or at least the upper surface, for I could detect none on the lower. Are there two species of sawfly, or are both larvæ, those of the pear and those of the cherry trees, identical? Of butterflies, the common *Pieridæ* have been excessively abundant, settling in patches on the watered roads, and sipping up the moisture thus afforded. Beyond these, and the *Vanessas*, *io*, *atalanta* and *cardui*, and such-like species, always to be met with, there have been very few again this year. — JOSEPH ANDERSON, jun.

ON THE URTICATING PROPERTIES OF THE HAIRS OF *LIPARIS CHRYSORRHŒA*.—Merrin in his 'Calendar' (apparently quoting some other author), says that the larva of *Liparis chrysorrhœa* is "painfully undesirable to handle," and Dr. Knaggs uses exactly the same expression. For some time I was entirely at a loss to understand what was meant; and, even now, I cannot say that I fully comprehend the phrase as applied to the larva, although I have found from experience—a very "painful" experience too—that the breeding of *Liparis chrysorrhœa* is anything but a pleasant operation. But is it the larva which is so "painfully undesirable to handle," or has the phrase been copied from one authority to another, as is so frequently the case? Certainly, after a rather extensive acquaintance with this species during the last two years, I have felt no ill effects from the larva. I cannot say the same of the cocoon, for, within a minute or two of touching one, my face and neck have been covered with eruptions, very much resembling "nettle-rash," accompanied by an intolerable itching. For some time I could not bring myself to

believe that the cocoons were the cause of my discomfiture. On one occasion, when I had been clearing a few empty ones out of a breeding-cage, my agony was so intense that I rushed off, almost in a state of temporary insanity, to a surgeon, and he assured me that it was nothing but "pure nettle-rash," and put me through a course of medicine accordingly! Since then, I have been convinced, without the shadow of a doubt, what was the real cause of the "pure nettle-rash." Quite recently I took up a small tin box, in which was the remains of a cocoon, and, knowing what would be the result if I carelessly emptied it, I took what I thought ample precautions—I held the box at arm's length and cleared it out with my penknife, but, nevertheless, in a few minutes the old symptoms appeared, though not in quite so virulent a form. I forthwith had some boiling water poured into the box, and mentally resolved to have nothing more to do with *Liparis chrysorrhœa* in the pupa state. Being now so well acquainted with the effects, I feel what I hope is a pardonable curiosity to know a little more of the cause, and should feel extremely grateful to any one for enlightenment.—GEO. BALDING; Ruby Street, Wisbech, September 3, 1884.

[Perhaps one of our medical correspondents will throw light on this subject. Do minute hairs stick into the ducts of the skin-gland, or are they sharp enough to go right through the epithelium?—ED.]

PECULIARITIES OF THE PRESENT SEASON.—Several divergences from the usual order in the changes of Lepidoptera have this year come under my notice. They may prove interesting to other entomologists, who may be able to account for some of them. Last year I had some ova of *Endromis versicolor*, which hatched June 1st. The larvæ made their first change on June 8th; their second on June 19th, 20th; their third on June 29th; their fourth on July 9th, 10th, 11th. One died, but the remainder spun up from July 22nd to August 5th. One fine male emerged, March 16th; and another on the 22nd of the same month. The others have refused to do likewise, and remain still healthy pupæ, purposing, I trust, to come forth next spring. Is this mode of procedure not common to *E. versicolor*? Last year I also bred some *Dicranura vinula* from eggs, three of which spun up in due time. Two of them

emerged in June, on the 13th and 16th respectively, but the third lives on still in a happy state of pupation. This year I had some larvæ of *Callimorpha dominula* sent to me, which have all turned out successfully, but two of the larvæ spun up in the same cocoon. The pupæ evidently found it close quarters, judging from their constant wriggles; still, they both produced perfect imagos in the proper time. Again, last February I received from a friend in North Wilts upwards of 600 larvæ of *Melitæa artemis*, which I fed up on *Lonicera periclymenum*. They thrived well on it, although, I suppose, owing to the cold winds of April, they far exceeded the usual time before coming to full growth. Then they began, during the latter half of May and the first half of June, to die off, fully grown, in considerable numbers. I managed, however, to get about 250 pupæ, but to my sorrow these soon began to shrivel up most unaccountably, in the end producing but sixteen perfect insects and a dozen or so deformities, between June 20th and July 8th. Some pupæ of *M. cinxia* dried up in a similar way. I have never heard of *Hepialus lupulinus* being double-brooded. On August 14th I was dining late at Ryde, when a perfect specimen flew through the open window on to the dinner-table, and was duly secured. On the 22nd of the same month another flew into my room after dark, at Bembridge, Isle of Wight (where I was staying); and a third, on the 26th, did likewise at Hambridge, Somerset. The three specimens differ in colour from a number I caught here early in June, the second of them having a distinct rosy tint pervading all the wings. Late in July one of my servants found a nearly full-grown larva of *Notodonta dictæa*, which went under ground the first week in August. To my surprise a lovely imago came forth the 5th of this month. I think it could not have been due till next year.—(Rev.) J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton, Sept. 10, 1884.

SERICORIS IRRIGUANA.—The note on p. 229 of the 'Entomologist' had escaped by attention till my cousin, J. W. Harris, of this place, called my attention to it last night. I never had the good fortune to take *Sericoris daleana*, but, as far as my experience goes, it is a much larger insect than *S. irriguana*, which I have taken freely on Craig Maigie, Invernesshire, at an elevation of about 3000 ft., and I never saw it lower. It flies there very low, and where the bearberry grows (*Arctostaphylos uva-ursi*), but is

not confined to it; and I cannot say that that is its food-plant. I cannot give any other reason why it should not fly at a lower elevation, but I never met with it lower. I have taken *Mixodia schulziana*, which is abundant on our Cheshire bogs, on the summit of the same mountain, at least 700 ft. higher than *S. irriguana*; so, unless the food-plant is never found below 1500 ft. above the sea, I think it is possible it might be found in the Black Wood of Rannoch; but if it is, why not find it low down on Craig Maigie?—N. COOKE; Derwent Bank, Broughton, *viâ* Carlisle, Oct. 9, 1884.

[If *Arctostaphilos uva-ursi* is the food-plant of *Sericoris irriguana*, that will account for its absence from the Black Wood of Rannoch, for I am not aware that that plant ever reaches so low an altitude as even the higher ground of the Black Wood by several hundreds of feet.—J. T. C.]

LEIOPTILUS MICRODACTYLUS.—Mr. South, when he mentions the food-plant of *L. microdactylus*—*Eupatorium cannabinum*—says of the larva, "Feeds on the flowers" (Entom. xv. 103). I suppose he takes it for granted that it is so; now I am not going to say it does not, but what I wish to do is to record a few facts, so that others may draw their conclusions. From the few observations I have been able to make on this insect, I should say the larva fed in the stem. By searching a number of plants I have been able to discover many larvæ by the appearance of the flowering-stem—*i. e.*, when the larva has entered the stem rather high up I find that the main flowering-stem has been dwarfed, and that the two flowering stems springing from the joint below have grown above the main stem; whereas if the stem had not been injured the main flowering-stem would be above or on the same plane. This, I think, is very good proof that the larva is an internal feeder; but another thing, supposing the larva fed on the bloom and only entered the stem to turn to a pupa, I have an idea that the plant having flowered would not make any more growth; but we find where the larva is located there is always a slight swelling of the stem.—G. C. BIGNELL; 7, Clarence Place, Stonehouse, August 25, 1884.

HABITS OF LEIOPTILUS MICRODACTYLUS LARVÆ.—On the 25th of August last Mr. Bignell, of Stonehouse, was good enough to send me larvæ of *Leioptilus microdactylus*, together with portions

of the food-plant, *Eupatorium*. Mr. Bignell also at the same time favoured me with a copy of his note to this Journal, in which he records his observations of the habits of the larva of this plume-moth. In my description of *L. microdactylus* (Entom. xv. p. 103) I stated that the larva fed on the flowers of hemp agrimony. Now, however, after having had an opportunity of seeing larvæ in the fresh green stems, before they had formed their cocoons in which to pass the winter and ultimately pupate, I can quite agree with Mr. Bignell that they do feed in the stems. But I cannot form so positive an opinion as to whether they do so or not from the moment of leaving the egg. In only one instance could I find anything that looked like a point of entry; this was situated on the opposite side, and a little above a larger hole just below a joint. By carefully paring the stem, I found a dark streak running from the small hole to the cell in communication with the larger hole below the joint. The larger holes in the stems are evidently so constructed that they shall afford egress to the perfect insects, but they may have served for the larva's ingress also. I hope Mr. Bignell will give this larva his further attention, and, if possible, investigate its earlier history.—RICHARD SOUTH; September 1, 1884.

CARNIVOROUS BEETLES VEGETABLE FEEDERS.—*A propos* of Mr. Horner's remarks on *Pterostichus melanarius* (Entom. xvii. p. 238), I think few carnivorous beetles will refuse to eat fruit, fleshy roots, or tubers occasionally. I have seen three specimens of *Carabus violaceus* disputing possession of a half-rotten apple, and turning savagely with open jaws on to my fingers when I attempted to dispossess them of the "bone of contention." My cellar communicates with the open air by means of a flight of steps, covered by folding-doors, which latter are greatly affected by changes of weather. Not only insects, but frogs, toads, and other Reptilia find their way into the cellar. Of beetles, three *Carabi*, some half dozen *Pterostichi*, sundry species of *Anchomenus*, *Amara*, *Bembidium*, *Harpalus*, and numerous *Brachelytra* have been taken there from time to time; and, although they have not been clearly detected, there is *prima facie* evidence to connect them with the holes eaten in potatoes, turnips, and the like, which for convenience have been placed in the cellar. I am glad to say we are not troubled with *Blatta*, or that might have to bear some part of the charge. Under the circumstances

it is difficult to account for the holes, if not caused by the beetles. I also have frequently found *A. spinipes* on the flower and seed-heads of *Centaurea nigra*, but have connected them with the presence of Aphides and small plant-bugs, which generally abound. It is possible that the pollen or the milky condition of seed was the real source of attraction.—THOMAS H. HART; Park Farm, Kingsnorth, Ashford, Kent.

‘THE ENTOMOLOGIST’ LIST.—A correspondent writes:—“In your remarks anent this matter (Entom. xvii. 240) you speak of the ‘growing desire on the part of many British entomologists to cast off their insular prejudices,’ &c. May I ask what this means? Is it that it does not *now* matter whether a specimen or variety be British or continental, and that the former are now of no more value than the latter? This would be very unpleasant for those who have spent both time and money in order to make their collections really British.” I have already expressed my views upon “British Lepidoptera” (Entom. xv. 111), and these opinions I still hold. My remarks above quoted do not in any way intend to express the opinion that those who choose to study only British insects should be dissuaded from making such veritable collections. On the other hand, frequent applications for advice (especially since the publication of Dr. Lang’s fine work on the European butterflies) as to where to obtain other than British species of Lepidoptera, induce me to repeat that such “growing desire” to study those Lepidoptera closely allied to species which occur in this country, and indeed the whole European fauna, exists among many British entomologists.—JOHN T. CARRINGTON; Savage Club, Savoy, London, W.C., October 8, 1884.

ACHERONTIA ATROPOS AT EARLS COLNE.—*Acherontia atropos* has been found in some quantity in small lots of potatoes grown in this village. Some few were brought me in both larval and chrysalid state. I hear that many more have been seen, and met with an untimely end. A few fine specimens have emerged.—J. A. TAWELL; Earls Colne, Essex.

LAPHYGMA EXIGUA NEAR BASINGSTOKE.—On August 17th, whilst sugaring on some hurdles dividing two fields near Basingstoke, I took a lovely specimen of *Laphygma exigua*,

in company with *Epunda lutulenta*, *Agrotis suffusa*, and others.—PERCY RENDALL; 20, Ladbroke Square, London, W., October 21, 1884.

REVIEWS.

Third Report of the United States Entomological Commission.
Washington: 1883. 347 pp. Demy 8vo, with Appendices, 85 pp.; one coloured and three plain maps and 64 plates.

THIS very handsome production, on the part of Mr. C. V. Riley and his colleagues, makes one feel how much ahead are our American cousins in practical Entomology, and some shame that our Government should not follow the enlightened example of the American United States Department of Agriculture. Much as some of our friends have done privately in the cause of Economic Entomology in this country, it is too much to expect of them to issue such works as these American reports, when the enterprise, being for the public good, ought to be that of the State.

The Report now under consideration deals with "The Rocky Mountain Locust, the Western Cricket, the Army Worm, Canker Worms, and the Hessian Fly; together with descriptions of larvæ of injurious forest insects, studies of the embryological development of the locust and of other insects, and on the systematic position of the Orthoptera in relation to other orders of insects." A large proportion is devoted to locusts, of which there have been already no less than 273 species identified on the North American Continent, north of Mexico; "and," says the author of the report (Mr. Lawrence Bruner), "probably many others remain to be discovered." He continues "All these are more or less injurious to the agriculturist, and to those who are in any way dependent upon products of the soil for their living." The remarks upon these insects are most exhaustive and interesting; for not only do they deal with locusts in America, but an appendix reviews their history as known in other parts of the world, especially in China and Russia.

So important is the subject of the Hessian fly (*Cecydomia destructor*) a very small dipteran, which is allied to our familiar daddy-long-legs or crane-flies, that ninety-three pages and a map

showing its distribution are devoted to it. It appears that this pest was unnoticed until 1779, since which year it has spread to such an extent that the cultivation of wheat in the New England States was abandoned about twenty years ago, on account of the ravages of this fly and the wheat midge. Its present range appears to embrace all the United States north of the 35th parallel of latitude and east of the 93rd meridian.

These reports must be of the greatest use to the intelligent farmers of the States, as they not only describe their natural enemies, but give valuable suggestions for the reduction of the numbers of these pests or their actual extermination.—J. T. C.

The Butterflies of Maine. By C. H. FERNALD, A.M. 104 pp.
Augusta, 1884.

AN addition to the title-page of this work explains that it is "designed for the use of the students of the Maine State College, and the farmers of the State." It is illustrated with somewhat unsatisfactory woodcuts, representing types of genera, which are frequently accompanied by cuts of the ovum, larva, and pupa of the species under consideration. Mr. Fernald has evidently taken great pains to so present the subject to his readers as to make it lucid and easily grasped, in which object he has quite succeeded. Any person, no matter how completely ignorant of insects, after mastering his very terse, yet lucid, introduction of less than a dozen pages, cannot fail to learn enough to form a foundation of knowledge for future successful study.

There appear to have been sixty-nine species of the Diurni in Maine, a schedule of which is given at the commencement of the work, with scientific and trivial names. Among the latter are some which are characteristic of our American cousins; for instance—*Vanessa antiopa* is known in Maine as the "Mourning Cloak," and *Pamphila zabulon* as the "Mormon." We ought to add that this list is evidently only intended for reference, as such names do not appear in the body of the work, which is throughout most carefully compiled, and constructed on thoroughly scientific lines.—J. T. C.

Remarks on Scientific Nomenclature. By C. S. GREGSON.

Dedicated to the young Naturalists of the world. Liverpool, 1883.

ALTHOUGH issued early last year, this pamphlet has only just come under our notice. It is a curious stringing together of a series of "remarks" upon somewhat disconnected subjects,—such as the British Constitution; Editors of Scientific Magazines, whose "little learning puffs them up" (when they decline to insert certain articles); Mrs. Noah receiving the Animals as they entered the Ark; Scientific Nomenclature; the British Association not supplying everyone with a gratuitous copy of their Reports; the origin of Hooker's Flora; and some original poetry;—all written we presume for an elaborate joke, as the author says in his preface, "whilst in a merry humour one idle night," and "published exclusively for young naturalists; experience teaches that it is useless writing for old ones." The writer of the pamphlet is rather hard on the "old ones." Why not allow them also to participate in the joke? unless it is intended for "beginners only." The whole gist of these "Remarks" may be summed up as a recommendation to young naturalists that in future nomenclature "anything will do," if only a recognised terminal be used; even such a name as *Charlesstuartgregsonella*. —J. T. C.

OBITUARY.

WE regret to have to record the death of Mr. ALFRED HARPER, which occurred somewhat suddenly at his residence, 66, Mansfield Street, Kingsland, on the 19th inst. Mr. Harper had nearly completed his seventy-first year, and had been from his earliest days an ardent and persevering collector of British Lepidoptera; and had, with the assistance of his sons, formed a very complete collection, containing many rarities and local species. He was one of the original members of the Haggerston Entomological Society, and up to the time of his death filled the post of Treasurer to that institution, in the proceedings of which he always took the warmest interest. His ever ready willingness to impart information to young entomologists, coupled with his general amiability of disposition, endeared him to, and made him respected by, all those who had the pleasure of his acquaintance.

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[No. 259.

A NEW BRITISH DELTOID, *HYPENA OBSITALIS*, Hüb.



HYPENA OBSITALIS, Hüb.

ON the 21st of September last, I captured a moth unknown to me, at rest on a door jamb in my flower-garden. It was evidently a *Hypena*, but quite distinct from either of our known British species. My old friend, Mr. F. Bond, has kindly compared it with specimens in the British Museum collections, and determined it to be *Hypena obsitalis*, Hüb., not before recorded as British.

O. P. CAMBRIDGE.

Bloxworth, Blandford, Dorset, Nov. 10, 1884.

[From *Hypena rostralis*, which is our nearest allied species, *H. obsitalis* differs considerably in having somewhat longer anterior wings, which are pointed and more mottled with black than in *H. rostralis*. The best character for identification is the angular or elbowed line across each anterior wing in *H. obsitalis*; these wings are brown, and in addition to the black markings already mentioned, are some of an obscure pale yellow colour. In our collections this addition to our fauna will follow *H. rostralis*. The figure above is taken from a Continental example of *Hypena obsitalis* formerly in the possession

of the late Mr. Henry Doubleday, and closely resembles the specimen recently captured by the Rev. O. Pickard-Cambridge. —ED.]

RANDOM NOTES ON NEW ZEALAND LEPIDOPTERA.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S., &c.

(Concluded from p. 250.)

ON February 7th I had arranged to go to Drayton, at the foot of Mount Hutt, and some seventy miles from Lyttelton, where I had been kindly invited by Mr. Chapman (a brother-in-law of Mr. Fereday's) to stay for a few days for the purpose of ascending the mountain for *Erebia pluto*, which is to be found there at an elevation of 4000 feet. Unfortunately when I rose in the morning it was pouring with rain, and the glass showed such evident indications of bad weather that I decided not to go, especially as I had been told that *E. pluto* only flew in the brightest sunshine. Moreover, Drayton was a long way off, and there was only one train daily each way, as far as Methven, from which one had to drive five or six miles further to Drayton. As it afterwards turned out I was sorry I did not go, for there was no rain at Drayton, and this and the two following days were beautifully bright and fine. I have since found out that it often rains and blows at Lyttelton when it is perfectly fine inland.

On February 9th I went to Springfield, a small township near the Mount Taurus range, in the hope that I might be able to ascend some distance, and by chance come across *E. pluto*; but when I reached the place, and asked the proprietor of one of the hotels how long it would take to walk to the top of the nearest point, I was informed, much to my disgust, that I should have started at daylight, and that then I could not have got there and back unless I happened to be an exceptionally good walker; so, as I had only about four hours at my disposal, I had to give up all idea of it. The air in this country, particularly near the mountain regions, is so beautifully clear and highly rarefied that distant objects always appear to be very much nearer than they really are. My time being so short I procured a trap and drove to the foot of one of the nearest spurs, and as this took me more than an hour I had only about two hours left to wander about in;

and of course I could not expect to do very much in this time. *Argyrophenga antipodum* were flying in large numbers, and there were a greater proportion of females than there were at White-cliffs on the 31st of last month; and *Chrysophanus salustius* and *C. boldenarum* were plentiful. I also had the pleasure of taking to-day, for the first time, *Lycæna oxleyi*, a very delicate and distinct species; and a very pretty *Euclidia* was disporting itself in a rough stony place on the hill-side, where it was difficult to catch. By the time I had pinned and boxed a sufficient number of these species, with the addition of a few small Geometræ, it was time to return to the farm where I had left my trap, and drive back to the station, where I arrived just as the last train was starting, and reached Lyttelton again at nine o'clock. The railway carriages near Springfield were full of a small Pyralæ (*Scoparia diptheralis*), which were disturbed as the train passed, and came flying in through the open windows.

On February 17th we arrived at the Bluff, the port of Invercargill, almost the southernmost point of the middle island; and the next morning I left by the first train for three days' fishing to a place called Waipahi, a small township intermediate between Invercargill and Dunedin. The country through which we passed was mostly flat, though in some places hilly or undulating, with a lofty range of mountains to the westward. As we got further away from Invercargill it became wilder and wilder in appearance, until at last for miles on each side of the line there was nothing but unbroken ground overgrown with the usual tussock grass. In some places where it was low and marshy, and by the margins of all the creeks, as they call small streams in this country, there was plenty of native flax, which grows in large clumps, the broad sharp-pointed leaves attaining a height of six or seven feet, while the flowering stems are a foot or two higher; at a distance they look something like aloes. Waipahi is situated upon a river of that name, and is fifty-six miles from Invercargill; we took three hours and twenty minutes on the journey, so the speed was not dangerously rapid. The three days I was there were almost entirely devoted to trout fishing, and nearly all the fish were caught with a small Cicada placed and thrown upon an artificial fly. These Cicadæ were found in the tufts of tussock grass; and when the sun is bright and warm they crawl up the stems and chirrup in a most lively fashion, and are then

easy to see, but by no means easy to catch, as they fly off rapidly in their peculiar jerking manner if abruptly approached. When the weather is dull they creep down amongst the thick stems, and are then difficult to find, although when one's hand is drawn over them they at once begin to chirrup, and so betray themselves. The males are a pale umber-brown, and the females a light green; the former were the most attractive bait.

On one occasion, whilst hunting for these Cicadæ, I found a male *Argyrophenga antipodum* sitting on a stem beside its empty chrysalis; the chrysalis was attached by the tail to the stem of grass, after the ordinary Satyrid fashion. A prolonged search failed to disclose any more, although I have no doubt that there were many others close at hand; but I frequently came across larvæ of different *Leucanidæ*, and a strange-looking *Pterophorus* was not uncommon, and when disturbed, instead of flying, it endeavoured to creep and hide itself away amongst the thickest stems. Many of the clumps were a good deal eaten, especially the tops of the stems, and there was a quantity of old frass at the roots of most of them. Probably anyone sweeping the tussocks at night a month earlier would have been rewarded by the discovery of the larva of *A. antipodum*, which I expect crawls up the stems to feed, after the manner of *Satyrus janira*, *S. tithonus*, *Cænonympha pamphilus*, &c.; and I am not aware that it has yet been described by anyone.

In addition to *Argyrophenga antipodum*, which was abundant at Waipahi, *Chrysophanus salustius* was common; but I saw no *C. boldenarum*; it was perhaps too far south for it. *Lycæna oxleyi* occurred in some numbers, and *L. phæbe* was not rare. This latter butterfly appears to be generally distributed throughout New Zealand, Australia, and Tasmania; and I have also taken it in Fiji, the New Hebrides, and New Caledonia.

The river ran within a few hundred yards of the little inn I was staying at, and after my evening meal I strolled out to its banks for a quiet pipe. Noctuæ were flying in numbers over the rushes and flax, and most of them appeared to be *Leucanidæ*, among which were *Leucania semivittata*, something like *L. obsoleta*; and *L. unica* and *L. sulcana*, which are evidently antipodean representatives of our English *L. impura* and *L. pallens*. Later on *Nitocris comma*, a Noctua not unlike *Noctua c-nigrum*, came fluttering round the lamp upon my sitting-room table; and

various Crambites swarmed at the same time. Next day *Auchmis composita* was taken at rest on palings, and larvæ of *Heliothis* sp.? in thistle-heads; and the following day I returned to my ship.

From the Bluff we proceeded to visit several of the beautiful Sounds on the west coast, where nothing was done in the way of Entomology, my whole time being occupied in collecting ferns and shooting birds; and from thence, after brief stoppages at Wellington and Auckland, where I saw *Pyrameis itea* flying about the streets, we returned to Sydney.

H.M.S. 'Espiègle,' Suva, Fiji, June, 1884.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THANAOS TAGES.—It may be worth while to note, in connection with Mr. F. W. Frohawk's account (Entom. xvii. 49) of the sleeping position of *Thanaos tages*, that as long ago as June, 1857, I took two examples of that skipper under circumstances almost precisely similar to those mentioned by Mr. Frohawk. I subjoin the notice I then published of the observation, only adding that, until Mr. Frohawk's account and excellent woodcut came to my knowledge, I have never met with any confirmation of what I recorded so many years ago. 'Entomologist's Weekly Intelligencer,' vol. ii., p. 101, June 27, 1857:—"In the 'Manual' I see *Thanaos tages* mentioned as having 'wings in repose horizontal;' and certainly when settling on flowers or on the ground, in the sunshine, the wings are always kept so. But, on the 5th inst., while collecting *P. albus* in a chalk-pit, just at sunset (which, by the way, is much the best time for collecting that species, as they have then taken up their quarters for the night, and are easily taken while sitting on the grass-stems), I saw what I took to be a small *Noctua* resting on a thick stalk of grass. On stooping to examine it I found, to my surprise, that it was a specimen of *T. tages*, apparently fast asleep, as I tapped the grass on which it rested several times without causing it to move. The wings were folded so as to form a roof, as in most of the Bombyces and Noctuæ, with the upper side outwards; thus further proving the close affinity of the Hesperidæ to the moths. I pinned the *Tages* just as he was, and, after a slight flutter, he settled down into the same position. I afterwards thought that this might be an

exceptional instance, and that the *Tages* in question might only have been trying this position to see whether it was a comfortable one to repose in; but, on the 8th, in the same chalk-pit, during a slight shower of rain, I found another in a precisely similar position; and so am induced to believe that it must be a regular family practice. I find that *Pamphila sylvanus* (which is now abundant at Dorking) always reposes with all its wings erect, when alarmed at a passing object, in a shower of rain, or when resting for the night."—ROLAND TRIMEN; Cape Town, Sept. 12.

COLIAS EDUSA IN NORTH STAFFORDSHIRE.—On Sunday, September 28th, I noticed a male specimen flitting about in my garden in the afternoon. This insect has not been noticed here since 1877, when it was excessively plentiful almost everywhere in England, it being probable that there were as many as three distinct broods. It is remarkable that it should occur so far north this year, as I gather from your pages that, although somewhat widely distributed, it was not abundant. Among other insects I have noticed here, that have been strangers for some years, are *Macroglossa stellatarum* and *Vanessa cardui*; indeed of this latter I never saw so many here before. — THOS. W. DALTRY; Madeley Vicarage, North Staffordshire, October 28, 1884.

COLIAS EDUSA.—I saw two specimens of this insect in the New Forest in October this year; and one at Catford Bridge, Lewisham.—J. JENNER WEIR; Chirbury, Copers Cope Road, Beckenham, Kent.

COLIAS EDUSA IN KENT.—During the first week in August I saw a specimen of *Colias edusa*, flying at a rapid rate over the shingle at Walmer (near the Castle). I netted a lovely female specimen of the same species near Halling, Kent, on September 6th; and on the 15th and 16th of the same month I captured a dozen specimens, including three females, in a clover-field near Strood, Kent. These, with the exception of two examples taken near Sandown, Isle of Wight, are the only specimens I have seen since the memorable "1877 year," when I took a large number, including several of the variety *helice*. The field in which I took *edusa*, on September 15th and 16th this year, was in 1877 often alive with the species—sometimes several specimens on one clover-head. I should not be surprised if the species were common next season, as the insects I took were in lovely

condition. Being so late in the year, it seems not at all improbable that they might hibernate; or should they deposit ova, the larva might possibly pupate and pass the winter in that stage.—J. TUTT; Beaconsfield Terrace, East Greenwich, S.E., November, 1884.

COLIAS EDUSA AND LYCÆNA ADONIS AT FOLKESTONE AND DOVER.—Noticing the remarks of several of your correspondents as to the appearance of *C. edusa* at various places this autumn, I may record that I found it tolerably common at Dover in September last, having taken some five-and-twenty and seen very many others. I was also informed that it was out in some numbers in the Warren at Folkestone, so there are some hopes that next season may prove another "*edusa* year." The autumn brood, too, of *Lycæna adonis*, was exceptionally abundant at Folkestone, and, favoured by a spell of remarkably fine weather, one of my boys and myself were able to secure a few very nice varieties of this insect, the most notable being a black male, slightly tinged with dull indigo in certain lights. This was one of my son's captures, and unfortunately he must have had it in his net some little time before he noticed it, as the margins of the anterior wings are a little split; otherwise, it is a particularly fresh specimen, and is, I believe, a very uncommon form of this species.—E. SABINE; 17, The Villas, Erith, November, 1884.

GONEPTERYX RHAMNI AND COLIAS EDUSA IN DORSETSHIRE.—I have during the last season seen thirteen specimens of *Gonepteryx rhamni* in this county, all more than fifteen miles from the borders of the surrounding counties. As I have always understood that this was not a Dorsetshire butterfly, owing to the absence of buckthorn, I thought it worth noting. *Colias edusa* was very abundant round here in the second and third week of October.—M. J. MANSFIELD; West Lulworth Vicarage, Dorset, November 18, 1884.

VANESSA ATALANTA V. CARDUI, AND PLUSIA GAMMA IN NORTH DEVON.—Not having seen any notice in this magazine, as yet, of the unusual abundance of *Vanessa atalanta*, *V. cardui* and *Plusia gamma* this season, I venture to call attention to this fact. From about the middle to the end of September, and on many fine days since, these three insects have been in large numbers about here. *V. atalanta* I have never seen so plentiful, neither *V. cardui* nor

P. gamma since 1879. — Miss HINCHCLIFF; Instow, North Devon, November 13th.

CAPTURES IN AUGUST.—During August of the present year I walked through Surrey, Sussex and West Kent, and it is remarkable that though *Vanessa cardui* turned up at Littlehampton, New Shoreham, Guildford and other places, often being abundant, and usually in very good condition, another equally uncertain species, *Colias edusa*, was not observed at all. I caught an interesting fly, which proved to be *Asilus crabroniformis*, on Witley Common. At Addington I took one specimen of *Plinthus caliginosus*, and another interesting capture was *Hesperia comma*, which was not rare on the hills east of Guildford. *Satyrus semele* was very abundant on Witley Common, and I took one near Guildford. — T. D. COCKERELL; 51, Woodstock Road, Bedford Park, Chiswick, W., November 6.

BRITISH BUTTERFLIES.—I shall be much obliged if any of your readers can give me descriptions of the ova of *Pieris crataegi*, *Anthocharis cardamines*, *Leucophasia sinapis*, *Colias edusa*, and *C. hyale*; or if they cannot do so personally, will they inform me in what work I may find such descriptions; also if *Lycæna acis*, *Thecla pruni*, *Papilio machaon*, and *Leucophasia sinapis* have been taken plentifully this year, and if so, where? — W. HARCOURT BATH; Sutton Park, Warwickshire, Nov. 1884.

[In the last part of the French 'Annales' is an important paper by T. Goossens, on "the eggs of Lepidoptera" (Ann. Soc. Ent. Fr., ser. 6, vol. iv., pp. 129—146; pl. 5); it is illustrated by a beautiful coloured plate, on which the eggs of forty-two species are figured. Fig. 32 shows the egg of *Aporia crataegi*; fig. 23, *Anthocharis belia* (closely allied to *A. cardamines*); and fig. 34, that of *Colias hyale*. The egg of *L. sinapis* is described at Ent. Mo. Mag. iii., 211 (and cf. Newman's Brit. Butt., p. 154), and Mr. Hodgkinson speaks of it as "just the shape of a conical shot" (Ent. vii., 175). The egg of *C. edusa* is figured at Entom. xi., 49.—E. A. F.]

DEILEPHILA LINEATA AT SANDWICH.—Having been located in Sandwich during the past summer, I had the pleasure of capturing, on July 26th, a fine specimen of *D. lineata*. It was at rest on a granite street-crossing, and without doubt would have been crushed had I not rescued it from its perilous position; as

it was it has the appearance of having been touched on the left wing by something passing.—R. HARBOUR; 1, Landport Cottages, Deal.

CHEROCAMPA NERII IN DORSETSHIRE.—I have to record the capture of a specimen of this rare species, at a village about four miles from Blandford, Dorset. It was taken and presented to me by a friend, and is in fair condition. Blandford being more inland than any of the localities recently mentioned in the 'Entomologist' I think your readers may find this notice of interest.—T. B. JEFFERYS; Pacific House, Clevedon, November 4.

PUPA OF SPHINX CONVULVULI.—Last Friday, October 31st, a boy who works in the garden brought me a pupa of *S. convulvuli*. He told me his father had found it when digging, and had given it to him, and he brought it to me. It is in fine condition and alive; it is very large.—B. B. HUNT; The Grove, Woodford, Essex, Nov. 2, 1884.

LATE OCCURRENCE OF MACROGLOSSA STELLATARUM.—During the last month (October) several specimens of this insect in good condition were observed in different parts of this town. The last specimen I noticed was hovering at geraniums as late as October 31st.—EDWARD A. ATMORE; 3, Haylett Terrace, Lynn, Nov. 8.

LAPHYGMA EXIGUA.—Whilst collecting on the Culver Cliffs, Sandown, Isle of Wight, on August 26th last, in company with my brothers and sister, the latter disturbed a small Noctua, which at the time I did not recognise, from amongst the short grass. At the Haggerston Entomological Society's meeting, held Nov. 13th, Mr. E. G. Meek kindly identified the insect as belonging to the above species.—F. W. HAWES; 14, Dovecote Villas, Wood Green.

LAPHYGMA EXIGUA AND ACHERONTIA ATROPOS AT DEAL.—On returning home on September 20th, I found a fine specimen of *A. atropos* had been killed and left by a young gentleman for me to set out for him. By working the gas-lamps here for any of the genus *Ennomos*, of which I only took two *E. tiliaria* and one *E. erosaria* (males), I took another specimen of *L. exigua*, in fair condition.—R. HARBOUR; 1, Landport Cottages, Deal.

LAPHYGMA EXIGUA IN CORNWALL.—I write to inform you that while staying at Antony, Torpoint, Cornwall, I took three specimens of *Laphygma exigua*: one on October 4th, and two on the

6th, all at the same ivy bush on a garden wall. Miss C. L. Pole Carew, who was with me at the time, took a specimen four or five years ago flying in the garden; but not being aware of the value of the insect at the time did not keep a note of the exact date. I may add that not being far from Plymouth I submitted the specimens to Mr. G. C. Bignell, who has no doubt of their identity. I was at Antony till October 20th, and searched the ivy nearly every night, but did not see any more.—WALDEGRAVE; 13, Montagu Place, Montagu Square, W., October 27, 1884.

LAPHYGMA EXIGUA IN LANCASHIRE.—On the 16th of September, while in the Reform Club, Preston, I noticed a moth come into the room with a jerking flight, which for the moment I took to be *Stenopteryx hybridalis*. It shortly afterwards flew to a gas-light and dropped on to a table beside me. For a time I was somewhat puzzled, for though like *Caradrina cubicularis* its narrow wings and peculiar markings denoted some other species. It was off in a moment and disappeared, when I at once recollected that it was this rare species, having four specimens in my cabinet with which to refresh my memory. — J. B. HODGKINSON; 15, Spring Bank, Preston, November 1, 1884.

LAPHYGMA FRUGIPERDA.—It is noteworthy to remark, that while the very rare *L. exigua* is turning up in all directions in England, the closely allied *L. frugiperda*, Guenée, is proving an injurious insect in the United States. In the last Circular (No. 116) of the Illinois State Board of Agriculture, S. A. Forbes, the State Entomologist, writing from Normal, Illinois, under date October 14th, 1884, gives a four-page history of this pest, illustrated by a woodcut, with details of its larva. He writes:—"The winter wheat fields of Tazewell, Mason, and Fulton counties, and probably of adjacent territory, have lately been devastated by a caterpillar which has been very generally mistaken for the true army worm. . . . The damage already inflicted is very considerable, many hundreds of acres of winter wheat having been completely devoured in those counties, and subsequently resowed; but the loss impending is much more serious, since another brood of the caterpillars is likely soon to appear, making its attack upon the wheat at a period too late to allow replanting." Then follow remarks on its previous history (it has been known as an enemy of agriculture since 1845, when

it attacked the grass, corn, and sugar-cane of Georgia; but in Illinois it made its first appearance as an injurious insect in 1868 and 1870, and has not since been numerous enough here to attract attention), description, life-history, injuries to vegetation and remedies (mechanical destruction and poisoning).—EDWARD A. FITCH; Maldon.

URTICATING BY *LIPARIS CHRYSORRHŒA*.—There is, I believe, no doubt that the handling of the larva and of the cocoon of this moth ordinarily produces an attack of urticaria, a skin affection “characterised by the development of wheals, and accompanied by sensations of stinging, itching, and burning, like those produced by the sting of a nettle” (Liveing). I have no doubt that this is produced by the hairs, which hairs form a large part of the materials of the cocoon. A schoolfellow of mine, some years ago, had what I now recognise as an attack of the above affection, after having carried home several of these larvæ. Country children, who are in the habit of collecting these larvæ, being attracted by their bright colours, are very subject to it. After carrying them home in their handkerchiefs and aprons, and depositing them, they perhaps wipe their faces and necks, and forthwith suffer from an acute attack. The hairs, on examination, may be found sticking into the skin. In the case mentioned by your correspondent, the broken hairs must have been conveyed from his hands to his neck, and they were the direct irritant in both cases. Anyone who examines the human skin by the aid of a powerful lens, may see the innumerable orifices of the sudoviparous and sebaceous glands, commonly termed “the pores of the skin,” through which they might get access to the deeper layers, even if they were not strong enough to pierce the cuticle. I hope at some further time to be able to compare these hairs microscopically with the brittle knob-tipped hairs of *Urticaceæ*.—PERCY RENDALL; St. Bartholomew’s Hospital, E.C.

THE URTICATING PROPERTIES OF THE HAIRS OF SOME LEPIDOPTERA. — I am glad that your correspondent has called attention (Entom. xvii. 257) to this subject, and trust some definite information may be elicited concerning “urtication.” It may, perchance, not be generally known that the imagines of *Liparis chrysorrhœa* and *L. auriflua* possess this stinging property. I

was once conveying a newly-emerged specimen of the latter to the poison-bottle, and in some way or other let it fall up my arm, between the flesh and shirt-sleeve. It remained there but a second, as I immediately gave a shake, and got it down again without any apparent detriment to the moth; but in a very few minutes my arm looked as if it had been stung by nettles, and the irritation, which was almost unbearable, continued for nearly two hours. About this time my brother captured another, which he carried home in his hat. Like myself, being unacquainted with the poisonous nature of the perfect insect, he was surprised to see his forehead covered with little white lumps, causing an intolerable itching. So bad was it that he went to his medical man for advice, who told him that he must have checked the perspiration, and gave him some medicine accordingly. In some seasons the hedges by our canal swarm with the larvæ of *Liparis chrysorrhæa*, and, strange to say, I experience greater discomfort after the moths have left their cocoons, as I can scarcely walk by the hedges (if a wind be blowing) without face, neck, and hands suffering severely, and I dare not beat them for some time afterwards. The reason of this may possibly be, that as the moths emerge, the hairs, which are so plentifully used in the construction of the cocoons, are set free. Surely there must be some poisonous property in the hairs; the simple penetration of the skin could not cause such discomfort. Again, many hairy larvæ, such as *Acronycta aceris*, *Arctia lubricipeda* and *A. menthastri*, shed all their hairs, and with them line their cocoons, yet may be handled with impunity. In the case of the imago of *L. chrysorrhæa* and *L. auriflua*, I am inclined to believe that the irritation is caused by the white hairs which fringe the inner margins of the wings, and not the golden tail-tufts, as I have rubbed the latter over my hands with no unpleasant results. —JOSEPH ANDERSON, JUN.; Chichester, November, 1884.

EUPITHECIA NANATA, VAR. CURZONI.—In the 'Entomologist' (Vol. xvii., p. 240), is an account by Mr. C. S. Gregson of the northern form of *Eupithecia nanata*, which he describes as a new species, under the name of *Eupithecia curzoni*. As I have had more experience of this insect than any other collector, I should like to make a few remarks upon the subject, stating what I know of it. In the summer of 1880, I was collecting in the Shetland Islands for Mr. E. G. Meek, and, as your readers will remember,

I succeeded in getting together a very interesting collection of Lepidoptera, including a few of this variety of *E. nanata*. This was the first time that this variety was observed and recorded. In 1881 I again collected in the Shetlands, chiefly in Mainland, and again I took the variety, but this time a longer series, varying from our southern type to those dark-banded forms which were figured in the 'Entomologist' (vol. xiv.). In the season of 1883, with aid from Mr. C. E. Fry, I determined to work the extreme northern islands of the Shetland group, and succeeded while there in not only capturing the imagines in plenty, but also in breeding this variety in quantities, and afterwards sent them to our most eminent entomologists, who all agreed with me in considering it to be a very interesting form of *Eupithecia nanata*. After many opportunities of observing it in both larval and imago states, I must record my strong opinion that it is nothing more nor less than a variety of *E. nanata*. Mr. Gregson must have been perfectly aware of all these facts; and even allowing that it is a distinct species, which I am sure it is not, unless he received Mr. Curzon's permission to use his name, which I doubt, I think entomologists will agree with me that he has shown somewhat questionable taste in naming it after a gentleman who has collected but one season in the far north.—H. McARTHUR; Fareham, Hants, November, 1884.

[In the last part of the Stettin 'Zeitung' is a, to British entomologists, very interesting paper by August Hoffmann, on 'The Lepidoptera of the Shetland Isles, with notices of the occurrence of the species in other northern countries, in the North and Central German Mountains, and in the Swiss Alps.' (Stett. Ent. Zeit.. xlv., 353—375). Of *Eupithecia nanata* (?) Herr Hoffmann writes:—"Of this peculiar form I received six specimens, which are like those figured in the 'Entomologist' for 1881, pl. i., figs. 2 and 3. Dr. Staudinger, to whom I presented a pair, writes me as follows, 'A form of *Eupithecia* new to me, probably only a dark *E. nanata*. It probably comes next to the form *nanata* aberr. *obscurata*, Stgr., but exhibits such considerable differences from it that it does not agree with it.'" Then follows the description. "In my opinion this Shetland form deserves a distinct name. Whether it is to be considered a good species, or is to be placed as a variety of *E. nanata*, I do not attempt to decide. It flies in June."—E. A. F.]

COLLECTING IN SUFFOLK.—I had the pleasure of collecting in the neighbourhood of Tuddenham, in the early part of August, and was very much pleased with the result of three days' work. The following are my principal captures:—*Acidalia rubricata*, abundant in one field, scarce elsewhere; *Agrophila sulphuralis*, eight specimens only; *Spilodes sticticalis*, eight or nine; *Pterophorus latus*, over forty in very fine condition, nearly all on one evening, just before dark. *Catoptria citraria*, abundant; *Anticlea sinuata*, three larvæ on *Galium verum*, and larvæ of *Heliothis dipsacea* on low plants. I returned to town on the third day with over 250 insects on my setting-boards. What a contrast to my trip to the Isle of Unst, where I often had to work sixteen or eighteen hours for six or eight moths. Upon my second visit I spent all my time exploring in walking and driving. I inspected several pretty fens on the River Lark, also Fordham, Chippenham, &c. I shall be very much surprised if we do not hear of many rarities from this district, besides those already recorded.—E. G. MEEK; 36, Brompton Road, London, S.W.

NOCTUÆ NEAR BROMLEY, IN 1884.—Noctuæ round Bromley this season have been very erratic in their appearance, and it would be interesting to know whether other collectors in different parts of the country have noticed the same peculiarity. As I did not do any collecting during the early part of the year, I cannot say what insects came to the shallows or to sugar until the beginning of June; but during that month and July I worked a very good locality near this town, generally sugaring several times a week if the weather was suitable. On June 5th one specimen of *Cymatophora* or came to the sugar: in comparison with the succeeding evenings in June this might be considered very successful, as the usual result was absolutely *nil*, with sometimes one or two specimens only of such insects as *Acronycta psi*, *A. megacephala*, *Noctua festiva*, or *Grammesia trilinea*; the two latter of these are usually very common here, but this season I did not notice a dozen specimens of either species, and not one *Agrotis exclamationis*. In a grassy field *Leucania impura* was abundant; and this, with *Plusia gamma*, was the only Noctua which appeared during the month in any numbers. In July I met with no better success, seldom seeing more than two or three Noctuæ at sugar on the same evening, and these were,

without exception, of the commonest species; the only representative of the large number of this family, which are on the wing at this time of the year, and which was at all common, being *Miana furuncula*. During these two months, in which more than half the Noctuæ are out, not more than two dozen species came to sugar; and this surely cannot be put down to a want of warm evenings, as in the latter part of June, and again in July, the temperature was higher in London than it had been for some years past, and the days were followed by close, sultry evenings; but whether this was the case or not it did not seem to make any difference to the number of these Lepidoptera, of which there seemed a complete dearth, with the few exceptions mentioned above. During the first ten days in August a bright moon was visible in the evenings; but on the 11th, an intensely hot night, I sugared, and was much surprised at the result. On that evening at the trees there were more insects than I had seen on all the evenings of the two previous months put together:—*Apamea oculea*, *Miana strigilis*, *Tryphæna pronuba*, *Cosmia trapezina*, and *Xylophasia polyodon* were abundant; and *Tryphæna janthina*, *Leucania lithargyria*, and *Amphipyra tragopogonis* were also fairly represented. On the 15th, besides increased numbers of the above, *Noctua xanthographa* began to be a pest; and single specimens of *Tethea subtusa*, *Cerigo cytherea*, and *Catocala nupta* put in an appearance. During the next few days *Noctua xanthographa* was very abundant, as many as twenty often coming to one patch of sugar, and the following were noticed for the first time:—*Amphipyra pyramidea*, *Cosmia affinis*, *Mamestra brassicæ*, *Noctua c-nigrum*, *N. rubi*, *Phlogophora meticulosa*, *Gonoptera libatrix*, and *Agrotis segetum*. Towards the end of the month the weather became much colder (one day being 27° Fahr. lower than the previous one), and *Nonagria lutosa* was the only fresh species at sugar; while at the lamps *Luperina testacea* was common; and I also took specimens of *Heliophobius popularis*, *Hydræcia micacea*, and *Tapinostola fulva*. I was away from Bromley during the first fortnight in September, so did not sugar until the 15th of that month: the result on that evening was one *Amphipyra pyramidea* and one *Catocala nupta* at the sweets; one *Triphæna pronuba* and one *Xanthia silago* on the wing; and nothing fresh at the lamps; this, too, on an exceptionally warm evening for the time of year. Soon after this the weather turned

quite cold again, and Noctuæ were again as scarce as they had been in the early part of the summer. Thus during the month of August Noctuæ were at least as common as in ordinary seasons; while in the other months of the year, with about three exceptions, there was scarcely one to be seen. I should be glad to know whether any explanation can be given as to the cause of this peculiarity; and may mention in conclusion that other Lepidoptera did not share in the irregularity of the Noctuæ, but were uniformly scarce throughout the season.—P. WATCHURST; 11, Hope Park, Bromley, Kent, October, 1884.

EFFECT OF THE HOT SUMMER ON LEPIDOPTERA.—During the past season many larvæ have fed up in a very short time; eggs of *Ephyra pendularia* and *E. porata* laid between July 31st and August 2nd began hatching on August 6th; the *E. pendularia* fed up the quickest. The first larva to turn to a pupa was on August 18th (only twelve days from the time the larvæ hatched), followed next day by several more, and the last turned on August 31st. Out of twenty-eight eggs, twenty-six went to pupæ. As they fed up and turned to chrysalids in so short a time, I naturally expected a third brood, but none have emerged. *E. porata* did not grow quite so rapidly; the first turned to a pupæ on August 26th, and the last on September 20th. A female *Acidalia aversata* of the ordinary type laid a good batch of eggs on July 9th, which hatched on July 26th; these fed well on knot-grass, principally by night. During the daytime they scarcely moved. They grew fast and went to pupæ from August 15th to September 7th, and the imagos appeared from August 26th to October 2nd, altogether about one hundred, and the banded variety appeared to be about one in four. The banded form have produced some very dark and freshly-marked specimens. I have had to feed up this insect in previous years, but they always hibernated and died in the winter; and as I kept them in the same place this year as previously, the extreme heat must have been the cause of their feeding up so rapidly; yet it does not seem to have had any influence on some species. A female *Numeria pulveraria* taken at Loughton on May 24th, deposited eggs the same night, which hatched the beginning of June. They grew very slowly from the commencement. The first did not spin up until the middle of August, and some were feeding

as late as the middle of September, having fed them for fifteen weeks. Those that had not spun up I turned loose. My experience has been that the past season was no improvement entomologically upon the previous bad years, and I hear the New Forest has been a total failure.—J. N. KENWARD REDCLYFFE; Corona Road, Lee, October, 1884.

COLEOPHORA POTENTILLÆ, *Boyd*.—I am indebted to the kindness of Mr. Fletcher, of Worthing, for a liberal supply of larvæ of this new species; and knowing how much better larvæ of this genus thrive on growing plants, I went for a plant over to Wanstead, where *Potentilla tormentilla* grows in plenty. This I set in a large flower-pot, put a glass ring over it, placed the larvæ on the plant, and covered it with gauze. *P. tormentilla* grows under the shelter of dwarf bushes, principally bramble; and while digging the plant up I noticed some of the bramble leaves were blotched, which I found was the work of a *Coleophora* larva, so closely resembling those sent me by Mr. Fletcher that I believe them to be the same species. They occurred only on the bramble leaves nearest the ground, and were so abundant that I collected a hundred in about a couple of hours.—WM. MACHIN; 29, Carlton Road, Carlton Square, E., Nov. 10.

A NEPTICULA NEW TO SCIENCE.—In April last I reared two males and one female of a very handsome *Nepticula*, from leaves of a garden rose. Thinking they were *N. centifoliella*, I sent them to Mr. Stainton for inspection. He has, however, pronounced them to be quite new, and honoured me by naming them *Nepticula hodgkinsoni*. The beauty of this new little moth is fully conveyed in Mr. Stainton's remark, "What a resplendent insect it is!" I have been hard at work among rose trees, from the middle of August until the middle of October, but cannot tell whether or not I shall breed any more.—J. B. HODGKINSON, 15, Spring Bank, Preston, November 1, 1884.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—The Annual Pocket-box Exhibition of this Society was held on Thursday, November 13th, and as regards the number of members and visitors present was very successful. The exhibits, however, were hardly so numerous as on previous occasions, though many interesting boxes were on the table. Prominent among these was Mr. Meek's very fine lot of *Hepialus humuli*, from Unst, consisting of the

peculiar forms which are now so well known to entomologists. In the same case were several specimens of *Melanippe montanata* var. *shetlandica*, *Emmelesia albulata* var. *thules*, black varieties of *Noctua glareosa* and *Larentia cæsiata*, together with *Mamestra furva*, dark varieties of *Noctua conflua*, and some very extraordinary and beautiful forms of *Agrostis cursoria*. Mr. Meek also contributed specimens of the new *Eupithecia curzonii* and *Criniodes exulis*, all from the above locality. Mr. J. A. Cooper showed a magnificent lot of *Melitæa artemis*, reared on honeysuckle, and also specimens of *Polyommatus phlæas*, which he had succeeded in rearing from the ova; the specimens were full-sized and very brilliant in colour. In the same case were observed *Endromis versicolor* and *Petasia nubeculosa*, from Rannoch; two specimens of *Anthocharis cardamines*, having yellow markings in place of orange; a variety of *Lycæna corydon* with spotless underside, and many other interesting species. Mr. J. A. Clark exhibited a small box containing a suffused specimen of *Crocallis elinguaris* of peculiar colour, the insect looking more like *Ellopiæ fasciaria*; also *Melanippe rubiginata* var. *plumbeolata*, and a variety of *Cidaria fulvata*; four varieties of *C. corylata*, *Phibalapteryx lapidata*, *Dianthechia irregularis* and very fine *Melitæa artemis*. Mr. W. Harper had a nice series of *Angerona prunaria*, and also a second brood of same, the difference in size being very marked; also specimens of *Platypteryx falcata*, *P. lacertula*, *P. unguicula* and *P. hamula*. Mr. Southey showed a fine series each of *Hepialus sylvanus*, *Noctua rubi*, *Tæniocampa rubricosa*, *Xylophasia scolopacina* and varieties of *Abraxis grossulariata*. Mr. Gee also exhibited his splendid specimen of *A. grossulariata*, having the wings richly suffused with orange. Other exhibits were by Mr. Bartlett, *Phycis betulella*, *P. ornatella*, *P. subornatella* and *Crambus dumetellus*; Mr. Hockett, series each of *Callimorpha dominula*, *Boarmia rhomboidaria* var. *perfumaria*, and a variety of *Lycæna corydon*, with spotless underside; Mr. G. Gates, varieties of *Arctia caja*, all much suffused, and one entirely smoke-coloured with the exception of the body. These were a second brood, and Mr. Gates has obtained a third brood this year, some of which young larvæ he exhibited; Mr. May, case of life-histories of Lepidoptera; Mr. Machin, *Geometra smaragdaria*; Dr. Pool, specimen of *Chærocampa nerii*, captured at Tottenham; Mr. Boden, red form of *Tæniocampa gracilis*;

Mr. Williams, *Acronycta leporina*, *A. alni*, *A. ligustri*; also larvæ of *Macroglossa stellatarum* and *Ennomos angularia*; Mr. Hawes, specimen of *Laphygma exigua*, two varieties of *Smerinthus tiliæ* and others; Mr. Pratt, specimen of *Prionus coriarius*, captured at Chingford. Certain prizes having been offered for competition, these were awarded; and the President, in presenting them, expressed his regret that members had not taken more interest in them.—ERNEST ANDERSON, Hon. Sec.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—The Pocket-box Exhibition, held at the rooms of the above-named Society on the 20th ult., was a pleasant surprise to those who attended. No better display of Lepidoptera and Coleoptera has been seen for a considerable time, and it reflects great credit upon the members of the Society, which seems to be a growing one. Apart from the assistance mutually rendered in the identification of doubtful species, such meetings tend to produce a kindly feeling among collectors, and by bringing them together make them better known to each other. That the past collecting season has been somewhat better than its immediate predecessors can hardly be doubted, if the display at this Exhibition can be taken as a criterion; for not only were common species abundant, but many rarities figured among the exhibits. Standing out prominently were the Tortrices shown by Mr. R. South, among which were *Pædisca semifusca* and *P. sordidana*, obtained during his recent visit to North Devon; also the Pterophori of Mr. Wellman, including *Oxyptilus teucarii* from Boxhill, and *Platyptilus zetterstedti* from Folkestone; and, what was more interesting to breeders of Macro-Lepidoptera, three successive broods of *Timandra amataria*, in gradation from large to small, while in some *Acidalia incanaria* the reverse was the case. Long rows of each of *Sesia chrysidiformis* and *S. cynipiformis*, and of peculiar types of *Tæniocampa gracilis*, were shown by Mr. C. Boden, and among his *Nyssia hispidaria*, which were very fine, was one much-admired specimen with full borders to the fore wings. Nine *Boletobia fuliginaria* were shown by Mr. E. Upton, and Mr. R. Adkin exhibited varieties of *Smerinthus tiliæ*, besides Tortrices and Tineæ. Mr. H. Jobson's exhibit showed how variable an insect is *Angerona prunaria*; and Mr. G. Elisha, besides an extensive exhibit of Tineæ, showed a large number of well-preserved larvæ, among which I noticed that of *Pachnobia alpina*; also

preserved larvæ, showing the life-histories of many common species, were exhibited by the Secretary, Mr. Walter A. Pearce. Mr. H. T. Dobson's box contained a very good specimen of *Vanessa antiopa*, caught at New Malden; also *Stauropus fagi* and others. Among the other exhibitors were—Mr. West, of Streatham, with *Anticlea sinuata*; Mr. Cook with *Deilephila livornica*; Mr. Machin with *Acronycta alni* and *Geometra smaragdaria*; and Mr. W. H. Tugwell with *Vanessa urticæ* of very uncommon dark appearance, besides *Sesia sphegiformis*, *Acronycta alni*, and others. Nor were the Coleoptera or Hymenoptera unrepresented, for the excellent exhibits of Mr. T. R. Billups and Mr. G. A. Lewcock formed an exhibition in themselves. Among the numerous specimens shown by the former gentleman was *Dytiscus lapponicus* from Scotland, the rare and minute *Gymnusa brevicollis*, *Orchesia micans*, and a species believed to be new to Britain, viz., *Trichopteryx brevicornis*; and among the Fossorial Hymenoptera was *Odynerus reniformis*, with its parasite *Elampus panzeri*, and an exceeding rarity in the shape of a seven-legged specimen of *Phorbia fluccosa*. Among Mr. Lewcock's exhibit I noticed *Donacia menyanthidis*, *Pachyta collaris*, and the local species *Malachius ruficollis* and *M. pulicarius*, besides others equally good in the eyes of coleopterists; the whole forming an exhibition of which the South London Entomological Society may be proud.—W. H. WRIGHT; Secretary's Department, Inland Revenue, November 21, 1884.

REVIEW.

Rhopalocera Europæ descripta et delineata. The Butterflies of Europe described and figured. By HENRY C. LANG, M.D., F.L.S., &c. Illustrated with more than eight hundred coloured figures, drawn, mostly from nature, under the direction of the author. Royal 8vo. London: L. Reeve & Co., 1884. Vol. i., text pp. viii., 396; vol. ii. pp. xii. plates lxxxii.

OF late years the study of Entomology bids fair to rival the popularity of that of Botany. It is true that the subject is one of enormous extent, and that very much still remains to be done before our knowledge of even British insects can be said to be anything like complete; but every year the number of important

works is increasing. With our modern facilities for travel, and the increased study of modern languages, too, our knowledge is no longer confined to British species or British publications. Although J. F. Stephens wrote in English, he complained bitterly fifty years ago of German entomologists for not writing in Latin; and many of the errors in his works are attributable to his having frequently attempted to identify British species with those of Ochsenheimer and Treitschke, for example, by the aid of the Latin diagnoses only. The lepidopterists of a later period (about twenty-five years ago) collected only British species, and looked on the study of foreign insects with great dislike, and almost with contempt. Although there were several entomologists who collected foreign Lepidoptera at that time, yet the only man in England who made a special study of European Lepidoptera was Mr. J. R. Hind, who shortly afterwards gave up the study of Entomology, but to whose encouragement, and to that of Mr. Stainton, was really due the publication of Kirby's 'Manual of European Butterflies,' a book which, whatever its imperfections, broke the ice, and encouraged travellers on the Continent to collect and study butterflies for themselves; and the study of European Macro-Lepidoptera has recently been further popularised by the same author's 'European Butterflies and Moths.'

The publication of Dr. Lang's elaborate work marks another advance. Being restricted to a limited group (for the European butterflies only number about 300 species), the author has endeavoured to work up his subject thoroughly, and has not only described every recognised European species, with full notices of transformations, varieties, localities, &c., but has given us excellent figures of all the species, with but two exceptions, and of many of their larvæ. The indices too, a matter of no little importance, are very full.

Nor has Dr. Lang wholly confined himself to European species. One argument employed against collecting European insects was, that we could not draw a hard-and-fast line, and that if we extended our collections beyond Britain, in order to study the allied Continental species, we must likewise collect those of the adjacent parts of Asia. This is true in a wider sense than the objectors supposed, for everyone now clearly recognises that Europe forms but a part of the Palæarctic Region; and the authors of the standard 'Catalogue of European Lepidoptera'

(Staudinger and Wocke) have always given a subsidiary place in their work to the species of Northern, Western, and Central Asia, and Northern Africa; while the whole fauna of the Circumpolar Regions and of temperate North America is very similar to that of Europe. Hence, although Dr. Lang has only given figures and full descriptions of European species, he has added incidental notices and frequently short descriptions of most of the outlying species included by Staudinger, as well as of some of the allied North American species. We believe that it is Dr. Lang's intention, should circumstances permit, to prepare a companion volume to the present, in which all the butterflies of the non-European portion of the Palearctic Fauna should be fully described and illustrated. This would, from a scientific point of view, be an even more valuable work than the present, for the descriptions and figures of the greater part of these outlying species are scattered through a large number of periodicals, many of which are only accessible in the largest entomological libraries, and even so, are by no means easy to compare. While the first work will probably find its largest sale in England (although more comprehensive than any good Continental book issued at anything like a moderate price), the second would be indispensable to almost every lepidopterist who collects European butterflies at all; for nearly all lepidopterists who do not restrict their studies to the species found in their own immediate neighbourhood, open their collections to all species from the districts included in Staudinger's Catalogue.

Staudinger's last Catalogue, of 1871, although published thirteen years ago, and not based upon the latest and most natural system of classification, according to our present ideas, is yet the standard text-book of all collectors of European Lepidoptera; and we think that Dr. Lang has acted wisely in adopting its classification, and taking it as his general standard for the limits of species and varieties, although he has not followed it servilely, and has endeavoured to avail himself, as far as possible, of all accessible sources of further information up to the present date. The bibliography which he has appended to his work, though it might have been rendered more complete (for we miss the names of some authors whom we think Dr. Lang should have consulted, such as Berce and Speyer), will be found very useful to those who wish to carry on the study systematically,

and to refer to the original authorities ; and on the whole we can heartily congratulate the author on the production of a very useful and meritorious work.

OBITUARY.

ARNOLD FÖRSTER (or Foerster, his earlier use) died at Aix-la-Chapelle, on August 13th last, at the age of 74. He was born there on January 21st, 1810, educated at the public school there, soon to return as "Lehrer," in April, 1836, "Oberlehrer" in April, 1850 ; and in 1855 became entitled to "Prof. Dr. Foerster," an acknowledgment of his entomological studies from his country and from his university. He entered the University of Bonn in 1832, and, entomologically speaking, his own words now become of interest to all hymenopterists. In 1868 he wrote,—“In Nees von Esenbeck’s rich collection, which I became acquainted with at Bonn, I obtained the first suggestion—as it were the first bias—to a study which presented a new world full of unexplained phenomena. Here I also learnt, as I still keep in lively and thankful remembrance, to know the main generic types of the different orders of insects ; the knowledge of which could indeed only be attained to through autopsy, or with great exertions, from the deficient literature of that early period. The Neesian collection first gave my studies a fixed direction and determination. This author’s ‘Hymenopterorum Ichneumonibus affinium Monographiæ’ treats of the first three tribes of the parasitic hymenoptera,—the Chalcididæ, Proctotrupidæ, and the Braconidæ,—the study of which I have eagerly pursued throughout.” And so it is, for Förster has been a most voluminous writer on the parasitic Hymenoptera since 1841, when his monograph of the ‘Pteromalinen’ appeared. Since then we have had most elaborate—too elaborate—monographs of *Pezomachus* (1850—1), *Campoplex* (1868), *Hylæus* (*Prosopis*) (1871), *Plectiscus* (1871), and *Stilpnus* (1876), published in Wiegmann’s ‘Archiv,’ the ‘Rheinland,’ and the ‘Vienna Verhandlungen.’ When we find one species, Gravenhorst’s *Exolytus lævigatus*, divided into 57 species of females and 136 of males, it is natural to feel somewhat alarmed (see Verh. ver. Rheinl. xxxiii., 47—118). His various papers on the Tenthredinidæ, Proctotrupidæ and Chalcididæ in various serials, and his three “Centurien” of new

Hymenoptera in the 'Rheinland Verhandlungen,' are known to all hymenopterists. His best known works, however, are his 'Hymenopterologische Studien,' separately published in two volumes at Aix (Aachen), in 1851 and 1856; the first relating to the ants ("Formicariæ"), the second to the "Chalcididæ" and "Proctotrupii." It was on his Synopses of the Cynipidæ, 1869 (93 genera!); of the Braconidæ 1862 (210 genera!); and of the Ichneumonidæ, 1868 (640 genera!), that most labour was spent. These are presented in the forms of analytical tables, which in the case of these numerous hypothetical genera, about which there is a certain philosophy, does not altogether serve to lessen the labours of those who come after, although this was doubtless Förster's intention; for in his monograph of *Campoplex*—in which he describes seventy-two species from three Gravenhorstian ones—he prefaces it with these remarks:—"Without the help of an analytical table I should scarcely venture to offer the entomological public such prolix and numerous descriptions." As Francis Walker truly said of him—"Many of his genera have no certain resting-places, and the author would have deserved more praise if he had described a typical species of each genus." Förster was, however, a great master of the parasitic Hymenoptera and did some good work; whether his numerous genera and species will ever be adopted remains to be seen; extended knowledge will soon test their value. Doubtless he was a conscientious worker and a very laborious one; he was a fairly good correspondent (although Frederick Smith would certainly not have said so of him) and distributed specimens freely, too often, however, with manuscript names. We can but regret that so great a master is no longer amongst us, and can fully corroborate what we are told the journals of Aix-la-Chapelle are unanimous in saying, that Dr. Förster leaves to his fellow citizens the grand example of a life full of honour and of work. Förster's collection is said to be a remarkable one, and on the disposition of this greatly depend the ultimate results of his busy life. Förster, like his master Nees, was a distinguished botanist as well as entomologist; he was a whilom member of the London, French, Stettin, Vienna, and several other entomological and natural history societies.—E. A. F.

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AN

Paper by A. K. Lloyd p 302

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“ By mutual confidence and mutual aid
Great deeds are done and great discoveries made.”
POPE'S ‘Homer.’

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—
1885.

“ But who can paint
Like Nature? Can imagination boast
Amid its gay creation, hues like her's?
Or can it mix them with that matchless skill,
And lose them in each other? ”

WILLIAM THOMSON.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

- ADYE, J. MORTIMER, 262, 293, 301
ANDERSON, ERNEST, 327
ANDERSON, JOSEPH, 241
ANDERSON, JOSEPH, jun., 43, 173, 242,
243, 258, 302, 324, 327
ANDERSON, R. J., 290
ATMORE, EDWARD A., 167, 172
- BAILEY, G., 316
BALDING, GEORGE, 41, 122
BARCLAY, F. H., 24, 261
BARNARD, GEORGE, 160, 248
BELT, A., 293
BENSON, HENRY, 261
BIGNELL, G. C., F.E.S., 152, 247, 248,
286, 303, 326, 327
BISHOP, E. B., 74, 242
BLABER, W. H., 168, 263, 297, 303, 316
BLANDFORD, W. F., 294
BLANDFORD, W. F. H., 128
BODEN, C. J., 317
BONE, G. H. K., 263
BORER, JAMES, 165
BOSTOCK, F., jun., 259
BRIDGMAN, J. B., F.L.S., F.E.S., 13,
100, 205
BRIGGS, CHARLES A., F.E.S., 129
BRIGHT, P. M., 78, 79, 303
BROOKS, W., 290, 297
- CAMBRIDGE, Rev. O. PICKARD, F.L.S.,
249
CAPRON, E., M.D., F.E.S., 220
CARRINGTON, JOHN T., F.L.S., 79, 108,
139, 149, 167, 175, 187, 198, 199,
293, 303, 328
CAVE-BROWNE, Rev. S., 260
CHITTENDEN, D., 262
CHITTY, HERBERT, 46, 76
CLIFFORD, J. R. S., 21, 22, 51, 147,
254, 293, 301, 315, 325
COCKERELL, T. D. A., 20, 56, 74, 120,
127, 246, 300
COOK, A. C., 259
COOKE, EDWARD, 125
COOPER, BERNARD, 217
COOPER, J. A., 243, 245, 246, 294
CORDEAUX, JOHN, 267
COSTE, F. H. P., 293, 317
- COVERDALE, GEORGE, F.E.S., 48, 112
125, 152, 183, 218, 225
CRALLAN, G. E., 262
CREGOE, J. P., 294
CROSS, Mrs. ELIZABETH, 22
- DALE, C. W., F.E.S., 73
DISTANT, W. L., F.E.S., 146, 289
DRUITT, A., 258
DUNNING, J. W., M.A., F.L.S., F.Z.S.,
F.E.S., 73
- EDGEELL, DOVER C., 316
ELLISON, S. T., 245
ELSTOWE, GEORGE V., 201
- FANSHAWE, LYONELL, 65, 136, 190
FARREN, W., 74
FITCH, EDWARD A., F.L.S., F.E.S., 13,
100, 205, 299, 300
FOWLER, Rev. W. W., M.A., F.L.S.,
F.E.S., 151
FOX, N. P., 241
FREER, R., 121
FROHAWK, F. W., 257, 302
- GARDNER, EDMUND, 266, 267
GARDNER, J., 166, 218
GOLDTHWAITE, OLIVER C., 131, 260, 261
GOSS, HERBERT, F.L.S., F.G.S., F.E.S.,
122, 196, 313
GRAPES, GEO. G., 253
GREGSON, C. S., 52, 118, 150, 165
- HALL, C. G., 148
HARDING, MARTIN J., 51, 147
HARKER, GEO. A., 262
HARRISON, J., 244
HAWES, F. W., 265, 282
HILL, LEWIS F., F.E.S., 241
HILL, THOMAS, 73, 193
HODGKINSON, J. B., 54, 76, 122, 266, 322
HUDSON, GEORGE VERNON, 30, 153, 168
HUNT, C. B. HOLMAN, 324
- INCHBALD, PETER, F.L.S., F.E.S., 36,
124, 311
- JAGER, J., 317

- JEFFERYS, T. B., 121, 150, 244, 316
 JENKIN, ALFRED H., 121, 291
 JONES, A. H., 293
 JOY, ERNEST, 241
- KANE, W. F. DE V., M.A., M.R.I.A.,
 F.E.S., 45
 KAY, R., 295
 KERR, W. J., 262
 KERRY, F., 258, 261
 KING, T. W., 262
- LANG, HENRY C., M.D., F.L.S., F.E.S.,
 50
 LANSDELL, Rev. Dr. HENRY, 247
 LEWCOCK, G. A., 24
 LIVETT, H. W., M.D., 51, 77
 LLOYD, A., F.C.S., F.E.S., 302
 LOWE, Rev. FRANK E., 217
 LUDGROVE, THOMAS, 124
- MACHIN, WILLIAM, 55, 169, 173, 245,
 246, 264, 301
 MACMILLAN, W., 243, 260
 McRAE, W., 294, 296, 298
 MARRIOTT, F. F., 299
 MATHEW, GERVASE F., R.N., F.L.S.,
 F.Z.S., 295
 MELDOLA, R., F.R.A.S., F.C.S., F.E.S.,
 294
 MILLER, H., jun., 262
 MITCHELL, ALFRED T., 319
 MUTCH, J. P., 259
- NASH, W. G., 243
 NICHOLSON, WILLIAM E., 261, 307
 NORRIS, HERBERT E., 258, 303
 NOWERS, J. E., 317
- PEARCE, W. A., 268
 PEGLER, STEPHEN, 121, 127, 293
 PORRITT, G. T., F.L.S., F.E.S., 53,
 194, 264, 300
 POTTER, JOSEPH, 318
- RAMSDEN, HILDEBRAND, M.A., F.L.S.,
 F.E.S., 10
 RAYNOR, Rev. GILBERT H., 23, 51, 194,
 243, 315
- RENDALL, PERCY, 22, 218
 RIDING, W. S., B.A., M.D., 1, 287
 ROBINSON, A., 299
 ROSE, ARTHUR J., 131
- SABINE, E., 48
 ST. JOHN, Rev. J. SEYMOUR, 116, 257,
 258, 263, 292
 SANDFORD, HARRY C., 123, 192, 321
 SANG, J., 21
 SHARP, H., 77, 316, 323, 324
 SHELDON, W. G., 315, 318, 323
 SIMS, G. E., jun., 220
 SLADEN, Rev. C. A., 300, 323
 SOTHEBY, R. M., 55
 SOUTH, RICHARD, F.E.S., 3, 11, 96, 171,
 195, 273
 STACK, E., 213
 SWINTON, A. H., F.E.S., 21
- TERO, C. K., 194
 THORNEWILL, Rev. CHARLES F., 167
 TITE, GEORGE H., 241
 TOMLINSON, J. W., 257
 TRIMEN, ROLAND, F.R.S., F.L.S., F.E.S.,
 25, 57
 TRISTRAM, W., 259
 TUTT, J. W., 54, 70, 75, 94, 122, 169,
 188, 195, 218
- VAUGHAN, HOWARD, F.E.S., 229
 VENABLES, J., 260
- WALKER, Rev. F. A., D.D., F.L.S.,
 F.E.S., 6, 39, 91
 WALSHINGHAM, Rt. Hon. Lord, M.A.,
 F.L.S., F.Z.S., F.E.S., &c., 81
 WARREN, W., 126
 WEBB, H. J., 174
 WEIR, J. JENNER, F.L.S., F.Z.S., F.E.S.,
 81, 291, 305
 WELLMAN, J. R., 294
 WHITE, F. BUCHANAN, M.D., F.L.S.,
 F.E.S., 21
 WHITTLE, F. G., 244
 WILLIAMS, JAMES TRIMMER, 260
 WOOD, THEODORE, F.E.S., 261
 WOODBRIDGE, FRANCIS C., 162, 259, 299
 WRIGHT, W. H., 88

ALPHABETICAL LIST OF SUBJECTS.

- Abbott's Wood, notes from, 265
 Absyrtus, 15
 Acherontia atropos, abundance of, in
 Kent, 72; at Chichester, 243; in
 Somerset, 243; at Harwich, 258;
 in Huntingdonshire, 258; larva,
 295; at sea, 295; larva producing
 sound, 301; at Burton-on-Trent,
 317
- Acidalia virgularia, double-brooded, 51
 Aciptilia tetradactyla, 99
 Aconycta alni, 194; at sugar, 218;
 strigosa in Cambridgeshire, 128
 Agdistes bennettii in Norfolk, 172
 Agrotidae, on the identity of certain,
 148, 149, 165, 166, 167, 188
 Agrotis, on the genus, 94; præcox near
 Cambridge, 262

- Amblyptilia acanthodactyla*, 97; *cosmodactyla*, 97
Anacampsis (*Gelechia*) *albipalpella*, 245
Angerona prunaria, on breeding varieties of, 253
Anosia archippus in Cornwall, 290; *plexippus*, 305, in Cornwall, 291
Apanteles glomeratus, 326
Apatura iris in Hampshire, 284
Aphides, their partiality to strongly scented plants, 173; unusual migration, 254; abundance at Peterborough, 267; migration of, 303
Aporophyla nigra in Dorsetshire, 299
Appearance of *Lepidoptera*, unusual dates, 21, 22, 244, 323
Appias andersoni, n. sp., 146
Apterous sawfly, 247
Arctia mendica feeding on birch, 194
ARGYLLSHIRE—*Lepidoptera*, 229
Argynnis latona (*lathonia*) at Brighton, 241; *pandora*, late appearance of, 21; time of appearance, 50
Argyrolepis mussehlana at Deal, 218
Assam, silk in, 213
Asthena blomeri, 263, 300
Attractions for *Lepidoptera*, 151
- Bankia argentula*, larvæ of, 128
BERKSHIRE—Captures in, 266; *Thecla pruni*, 266; *Maidenhead*, *Ocneria dispar*, 243
Bombyx rubi, urtication of larvæ, 324
BOOKS REVIEWED:—
‘Russian Central Asia,’ by H. Lansdell, D.D., 174
‘Entomologica Americana,’ vol. i., no. 1, 198
‘Elementary Text-book of Entomology,’ by W. F. Kirby, 199
‘Eighth Report on Injurious Insects,’ by Miss E. A. Ormerod, 221
‘Transactions of the Entomological Society of London, 1884,’ 269
‘Handbook of European Butterflies,’ by W. F. de Vismes Kane, M.A., 304
Bournemouth, local list of insects, 79
Bryophila algæ, 122; par in Cambridge, 128
Burton-on-Trent and neighbourhood, *Lepidoptera* of, 177, 208, 231
“By mutual confidence and mutual aid,” 78
- Callimorpha hera* in Devon, 297, 317
CAMBRIDGESHIRE—*Acronycta strigosa*, 128; *Agrotis præcox*, 262; *Bryophila par*, 128
Campoplex, 15
Casinaria, 103
Catocala fraxini in Hyde Park, 318
Chærocampa celerio at Retford, 121, 293; at Berkeley, 165; in Surrey, 260; at Cromer, 261; at Lewes, 261; at Dovercourt, 259; at Pevensey, 259; at Ramsgate, 261; in London, 261; at Christchurch, 262; at Crosby, 262; in N. Wales, 262; at Holmwood, 262; at Felixstowe, 262; at Ealing, 293; in Essex, 294; at Folkestone, 294; at Bournemouth, 294; in Devonshire, 294; at Plymouth, 294; in Sussex, 275, 316; at Andover, 300; *nerii* at Hartlepool, 218
Charagia virescens, life-history of, 30
Charops, 100
Choleva spadicea near Nottingham, 124
Cidaria flavicincta, double-brooded, 22
Cleoceris (*Epunda*) *viminalis*, 244
Cnæmidophorus rhododactylus, 96; life-history of, 275
Coccyx scopariana, 266
Coleophora artimesiella, 55; *bilineatella*, 228; *saturatella*, 229; *spartiella*, 228; *tinctoriella*, 225, 228; *vibicigerella*, 246
Coleophoræ, notes on, 55
Coleoptera, notes on capture and preservation:—I. Apparatus, collecting in winter, 65. II. Killing and preserving, 136. III. Collecting in summer and autumn, 190
Colias edusa, economy of, 21; at Ware, 241; near Lyndhurst and Sevenoaks, 241; at Chichester, 243; plentiful at Frome, 257; near Newark, 257; near Cudham, 257; abundant in North Kent, 293; in North Devon, 293; at Lyme Regis, 294; abundant in Ireland, 322; in Sussex, 316; and *C. hyale*, 316; *helice* at Chichester, 258
CORK—*Lepidoptera* in Co., 123; notes from, 192
CORNWALL—*Anosia archippus*, 290, *plexippus*, 291, *Deiopeia pulchella*, 121, notes from, 287, *Polia xanthomista*, 287
Crambus alpinellus in Norfolk, 172; *myellus* in Glen Tilt, 245
Cucullia artemisiæ added to the British fauna, 290; *verbasci*, abnormal appearance of, 22
Cymodusa, 100
- Dasydia obfuscata* in Rannoch, 135
Deiopeia pulchella in Cornwall, 121; at Folkestone, 262; in Hampshire, 298
DERBYSHIRE—*Lepidoptera*, 318
DEVONSHIRE—*Callimorpha hera*, 297, 317, *Chærocampa celerio*, 294; at Plymouth, 294; North, *Colias edusa*, 293
Diptera, leaf-mining, in 1884, 124
Diurni of the Upper Engadine, 307; diminutive, 316
Donacia sparganii, 24

- DORSETSHIRE**—*Anosia plexippus*, 305, *Aporophila nigra*, 299, *Gonepteryx rhamni*, 21, 73, *Lycæna argiades* (n. Brit. sp.), 249, *Vanessa antiopa*, 293
- Dryinus formicarius* at Shiere, 220
- DURHAM**—*Hartlepool*, *Chærocampa nerii*, 218
- ENTOMOLOGICAL SOCIETIES.**—Cambridge, 128; North Kent, 174; London, royal charter for, 237; South London, 268, 328; Haggerston, 327
- 'Entomologist' List, 10
- Ephippiphora obscurana*, 173
- Epischinia farrella* in Norfolk, 172
- Erastria venustula*, 243
- Eremobia ochroleuca* abundant at Gravesend, 244
- Eriogaster lanestris*, 121
- Eriopeltis festuæ*, a scale-insect new to Britain, 286
- Errata, 24, 56, 79, 152, 303
- ESSEX**—*Chærocampa celerio*, 294, *Pyrameis huntera* not in (correction), 24; *Dovercourt*, *Sphinx convolvuli* and *Chærocampa celerio*, 261; Epping Forest during 1884, 88, notes from, 201, *Lycæna corydon*, 242, *Pædisca oppressana*, 245, *Ochsenheimeria vacuella*, 264; Harwich, *Acherontia atropos*, 258; *Walthamstow*, *Sphinx convolvuli*, 260; *Walton-on-the-Naze*, *Chærocampa celerio*, 294
- Euphrasia catena* near Nottingham, 167
- Eupithecia*, collecting the genus, 108, 139; *curzoni*, 52, 76; *linariata*, double-brooded, 51; *nanata*, variation of, 75
- Exchanging, 23, 48, 50, 77, 126, 127
- Flies, a pest of, 220
- Fossil insects, 196
- Fruit v. sugar, 160
- Gall collecting, notes on, 173
- Gall-gnats, a year's work among, 36, 311
- Geotrupes stercorarius*, economy of, 325
- GLOUCESTERSHIRE**—Berkeley, *Chærocampa celerio*, 165
- Goniodoma*, the genus, 112
- Gonepteryx rhamni* in Dorsetshire, 21, 73; on pink flowers, 300
- Grapholitha* (?) *cæcana*, 122; at Deal, 218; discovery of larva, 218
- HAMPSHIRE**—*Apatura iris*, 284, *Deiopeia pulchella*, 298; Andover, *Colias edusa*, 300; Bournemouth, local list of insects, 79, *Chærocampa celerio*, 294, *Sphinx convolvuli*, 296; Christchurch, *Sphinx convolvuli*, 258, *C. celerio*, 262, *C. celerio* abundant, 296, autumn sugaring, 301; Lyndhurst, *Colias edusa* near, 241; New Forest, "Trespassers will be prosecuted," 303, 311, past season, 319, *Rhopalocera*, 282
- Heliothis peltigera* in Yorkshire, 264
- Hepialus humuli*, late appearance, 21; in September, 123
- Hermaphrodite*: *Lepidoptera*, 168
- HERTS**—Ware, *Colias edusa*, 241
- HUNTINGDONSHIRE**—*Acherontia atropos*, 258
- Ichneumonidæ*, introductory papers on, 13, 100, 205
- Ichneumons* bred, other than from *Lepidoptera*, 152
- IRELAND**—Cork, *Lepidoptera*, 123; South, *Lepidoptera*, 321
- Japanese insects, relation between British and, 325
- KENT**—*Acherontia atropos*, abundance, 72, *Chærocampa celerio*, 294, *Lepidoptera*, 70; North, Entomological Society, 174; abundance of *Colias edusa* and *Vanessa cardui*, 293, re-appearance of *Vanessa io*, 315; Bromley, *Lepidoptera* in 1883, 20, 56; Chislehurst, *Triphæna ianthina*, 300; Cudham, *Colias edusa* and *Eremobia ochroleuca*, 257; Deal, *Argyrolepis mussehliana*, 218, *Grapholitha cæcana*, 218; Folkestone, *Deiopeia pulchella*, 262; Gravesend, *Eremobia ochroleuca* abundant, 244; Greenwich, *Myelois ceratonia*, 54; Maidstone, *Sphinx convolvuli*, 260; Ramsgate, *Chærocampa celerio*, 261; Rotherhithe, *Sphinx convolvuli*, 259; Sevenoaks, *Colias edusa*, 241; Sidcup and Footscray, *Sphinx convolvuli*, 260; Tunbridge Wells, *Tæniocampa leucographa*, 168, *Liparis monacha*, 263
- LANCASHIRE**—Bury, *Sphinx convolvuli*, 295; Crosby, *Chærocampa celerio*, 262; Preston, stray notes, 266; Southport, *Lepidoptera*, 300
- LEICESTERSHIRE**—Leicester, *Sphinx convolvuli*, 259
- Leioptilus osteodactylus*, 99
- Light, *Lepidoptera* at, in 1884, 74
- Lighthouses in 1884, notes on insects, 267
- Limneria*, 104
- Liothula omnivora*, life-history, 153
- Liparis monacha* at Tunbridge Wells, 263
- List of insects, local, Bournemouth district, 79
- Luperina gueneei*, 54; *dumerilii*, 54, 73, 74
- Lycæna argiades* new to Britain, fig., 250, in Somerset, 292, note, 293;

- artaxerxes in Rannoch, 131; bel-largus, 242; corydon in Epping Forest, 242, on Barnes Common, 316; icarus, var. at Rannoch, 133, probably single-brooded in Cork, 192
- Macroglossa stellatarum*, late occurrence, 147; at sea, 295
- Malay Peninsula, new species of *Pierina*, 146; new species of *Mycalesis*, 289
- Melanic variation in *Lepidoptera* of high latitudes, probable causes, 82, 122
- Melanippe tristata*, 244
- Melanism in Renfrewshire, 322
- Meleana flammea*, 241
- Melitæa aurinia* in Co. Cork, 123, unusual altitude, 147, in Argyllshire, 229; *cinxia*, 217; *athalia* in Sussex, 265
- Meligaster alvearius*, 248
- Microplitis ocellata*, 327
- MIDDLESEX—Ealing, *Chærocampa celerio*, 293; Holloway, *Sphinx convolvuli*, 259; London, *Chærocampa celerio*, 261, *Vanessa polychloros*, 315, *Catocala fraxini* in Hyde Park, 318
- Migration of Aphides, 254, 303
- Mimæseoptilus bipunctidactylus*, 98; *plagiodyctylus*, 195, life-history, 273; *scabiodactylus*, 150; *zophodactylus*, 99
- Mimicry in insects, 25, 57, 248
- Mounting *Lepidoptera*, 185
- Mycalesis ustulata*, new species from Malay, 289
- Myelois ceratonia*, 152; at Greenwich, 54
- Naphthaline, 55, 125
- Nola albulalis*, scarcity, 72
- Nomenclature, scientific, 46, 76, 120, and Lang's European butterflies, 45; natural history, 118
- NORFOLK—*Agdistes bennettii*, 172; *Epischia farrella* and *Crambus alpinellus*, 172; Cromer, *Sphinx convolvuli* and *Chærocampa celerio*, 261
- NORTHAMPTONSHIRE—Northampton, *Sphinx convolvuli*, 259; Peterborough, abundance of Aphides, 267
- Notes from my diary, 246, 300
- Notodonta trepida* and *trimacula* in Savernake Forest, 300; bicolor and *Sehirus bicolor*, 300
- NOTTINGHAMSHIRE—*Choleva spadicea*, 124; Newark, *Colias edusa*, 257; Nottingham, *Euphrasia catena*, 167; Retford, *Chærocampa celerio*, 121, 293
- OBITUARY—Cooke, Nicholas, 175; Cooke, Thomas, 200; Rye, Edward Caldwell, 79; Smith, Sidney, 56
- Ocnaria dispar* at Maidenhead, 243; in Warwickshire, 263; correction, 303
- Ochsenheimeria vacuella* in Epping Forest, 264
- Opheltes, 13
- Ophionidæ, 13, 100, 205
- Oriental entomology, 6, 39, 91
- Oxyptilus distans*, 89; *pilosella*, 98; *hieracii*, 98; *parvidactylus*, 98
- Pædisca oppressana* in Epping Forest, 245
- Pairing of *Lepidoptera* of different genera, 150
- Paniscus*, 13
- Papilio machaon* at Wicken Fen, 241
- Perforated ova of *Lepidoptera*, 324
- PERTSHIRE—Glen Tilt, *Crambus myellus*, 245; Rannoch, nine days at, 131
- Phibalapteryx polygrammata* [not] in Essex, 299
- Phoxopteryx upupana* near Warley, 246
- Phothedes captiuncula*, 266
- Pierina*, new species from Malay, 146
- Pieris daphidice*, 217
- Platyptilia*, the genus, 171; *bertrami* (*ochrodactyla*), 97, life-history, 279; *gonodactyla*, notes, 169, 195; *isodactylus*, 97
- Plusia interrogationis* at light, 299
- Polia xanthomista* in Cornwall, 287
- Portesia chrysorrhæa*, urticating properties of hairs, 22
- Pterophori*, British, larvæ, 96; contributions to the history (with plate), 273
- Pterophorus monodactylus*, 99; life-history, 277
- Pyrameis huntera* [not] in Essex, correction, 24
- Rannoch, nine days at, 131
- Reference collection, 127
- Reflector, for examining ventral surface of *Lepidoptera*, 125
- Renfrewshire, melanism, 322
- Resemblances, protective, in insects, 25
- Retarded appearances of *Lepidoptera*, 323
- Retinina turionana*, 169
- Rhopalocera* in the New Forest, 282
- Sagaritis, 101
- Sawfly, an apterous, 247
- Scoparia*, the genus, 129
- Scythropia cratægella*, 246
- Season, lateness of the past, 21; notes, 319

- Sehirus bicolor* and *Notodonta bicolor*, 300
- Setting Lepidoptera unpinned, 183
- Silk in Assam, the trade, cultivation, and experiments, 213
- Silkworms, wild and domesticated, 213
- Sirex juvenicus*, 302; at S. Norwood, 302; at Bognor, 302
- Soaring habit of *Vanessa atalanta*, 51, 73
- SOMERSETSHIRE—Lepidoptera, 51, 116, *Lycæna argiades*, 292, *Sphinx convolvuli*, 260; Frome, *Colias edusa* abundant, 257; Somerset, *Acherontia atropos*, 243
- Sound-producing larvæ, 301
- Sphinx convolvuli*, 243, 258, 294; at Chichester, 258, 259; at Christchurch, 258; at Rotherhithe, 259; at Holloway, 259; at Leicester, 259; at Northampton, 259; near Maidstone, 260; near Footscray and Sidcup, 260; at Walthamstow, 260; in Somerset, 260; in Surrey, 260; at Cromer, 261; at Lewes, 261; at Dovercourt, 261; at Bury, Lanc., 295; South of England, 295; abundance at Bournemouth, 296; in Sussex, 297, 316
- STAFFORDSHIRE—Captures in South, 193; Burton-on-Trent Lepidoptera, 177, 208, 231; Burton-on-Trent, *Acherontia atropos*, 317
- Stilbia anomala*, larva, 1, 53
- SUFFOLK—Felixstowe, *Chærocampa celerio*, 262
- Sugar, fruit *versus*, 160; *Acronycta alni* at, 218
- Sugaring at Christchurch, autumn, 301
- SURREY—*Sphinx convolvuli* and *Chærocampa celerio*, 260; Barnes Common, *Lycæna corydon*, 316; Esher, *Donacia sparganii*, 24; Holmwood, *Chærocampa celerio*, 262; Norwood, *Sirex juvenicus*, 302; Shiere, *Dryinus formicarius*, 220
- SUSSEX—*Colias edusa*, 316, *Melitæa athalia*, 265; Bognor, *Sirex juvenicus*, 302; Brighton, *Argynnis latona* (*lathonia*), 241; Chichester, *Acherontia atropos* and *Colias edusa*, 243, *Sphinx convolvuli*, 258, 259, *Colias helice*, 258; Eastbourne, past season, 319; Hurstpierpoint, *Chærocampa celerio*, 295; Lewes, *Sphinx convolvuli* and *Chærocampa celerio*, 261, 316; Pevensey, *Chærocampa celerio*, 261
- Tæniocampa leucographa* near Tunbridge Wells, 168
- Telenomus phalænæ*, 247, 303
- Thecla pruni* in Berkshire, 266
- Thymaris*, 100
- Timarcha levigata*, 267
- Tortrix* larvæ, abundance, 194; *viridana*, 245
- "Trespassers will be prosecuted," 303, 318
- Trigonophora flammea*, life-history, 162
- Triphæna ianthina* at Chislehurst, 303
- United States National Museum, entomological collections, 197
- Urticating hairs, of some Lepidoptera, 3, 41, 43, 74; of *Porthesia chrysorrhæa*, 22
- Urtication by larvæ of *Bombyx rubi*, 324
- Vanessa antiopa* in Dorset, 293; *atalanta*, 121, soaring habit, 51, 73, abundance, 51; *cardui*, abundance, 51, in N. Kent, 293; *io*, reappear-
appearance in N. Kent, 315; *polychloros* in London, 315
- Vanessidæ, habits, on emergence, 241
- Variation, of *Eupithecia nanata*, 75; melanin, probable causes, 81, in Lepidoptera of high latitudes, 122
- Varieties, of *Angerona prunaria*, breeding, 253
- WALES—North, Merionethshire, *Chærocampa celerio*, 262
- WARWICKSHIRE—*Ocnèria dispar*, 263
- Weather, influence on Lepidoptera, 122
- WILTSHIRE—Savernake Forest, *Notodonta trepida* and *N. trimacula*, 300
- WORCESTERSHIRE—Malvern, past season at, 319
- Xanthia ferruginea* feeding on ash, 301
- YORKSHIRE—*Heliothis peltigera*, 264
- Zygæna filipendulæ* impaled, 317, var. *ochsenheimeria*, 317

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NOTES ON THE LARVA OF *STILBIA ANOMALA*.

By W. S. RIDING, B.A., M.D.

THIRTY-FOUR eggs were laid, early in September, 1883, by some worn females of *Stilbia anomala*, which had been beaten from the heather at Woollacombe, N. Devon, some days before. They were globular, pale-straw in colour (soon changing to pink), and closely striated vertically. They were laid in batches.

Though kept exposed to the open air, the larvæ emerged on October 25th, by a small hole in the side of the eggs. They did not eat the shell. The young larvæ were semi-transparent, dingy green, with a pale brownish tinge underneath, and covered with some thin hairs, both arranged longitudinally and scattered. Each had three pairs of true legs and three pairs of claspers, four very indistinct elevations in front of the claspers indicating two rudimentary anterior pairs. In moving, they looped like Geometers. When at rest, they assumed a characteristic position on the top of the blades of grass, the third part of the body being fixed, the back arched, and the head tucked in under the front segments, looking just like so many minute sea-horses. They were easily disturbed, and in falling coiled themselves in rings.

On November 4th, many were noted as having the anterior rudimentary claspers distinctly visible and the head pale brown. On the 18th, a white spiracular line was observed, and on the 25th, when some of the larvæ had grown to a size of five lines in length, and after their second moult, the colour had changed to

reddish brown, and the dorsal and subdorsal as well as the spiracular lines were apparent.

On December 5th, the most developed were seven lines in length, and stretched themselves along the blades of grass when at rest, and were no longer so easily shaken off the food. The claspers on the seventh and eighth segments were by this time fully developed and the spiracles also conspicuous. From this date the larvæ gradually increased in size and the final markings became more distinct, till about the middle of January, 1884, when several appeared full-fed. Of these the following is the description:—Body, rather stout, cylindrical, smooth, tapering slightly towards each end, but mostly towards the posterior; length, 12 to 13 lines; head, semi-transparent, pale brown, spotted with a darker shade on the cheeks, and with a few scattered fine hairs. Ground colour of body pale-yellowish or reddish brown, closely spotted with darker. Dorsal line paler-edged, with dark brown shading off externally; the dark edge much intensified at the centre and division of the segments, especially at the latter, so as to give a dotted appearance, much less conspicuous on the three last segments. Sub-dorsal lines paler-edged, with continuous dark brown. Between these lines, on each segment except the two last, is a dark brown spot. The ground colour gradually deepens towards the spiracular line, above which it is rich dark brown, almost black. The spiracles have a black circumscription. The spiracular line is conspicuous, yellowish white in colour, spotted with very pale reddish brown. Below it the ground colour is much paler, so as to show a marked contrast between the upper and under surfaces. This paler band is succeeded by a similarly spotted darker one, and separated from it by an interrupted dark brown line. The second band is followed by another dark brown one, internal to the insertion of the legs. Claspers ten, the four front ones very slightly smaller than the others, but to such an extent as to be scarcely noticeable.

Up to this date the mortality had been small, only three larvæ having died. Between January 20th and February 17th the larvæ by degrees disappeared and were supposed to have pupated. The earth was not disturbed till the end of March, when it was carefully examined to remove the cocoons. It was then found that only three of the larvæ had gone down, and with

the exception of four shrivelled-up bodies, there were no remains of the others to be seen, though it was impossible for them to have escaped from the cage. The larvæ must therefore be cannibals, at all events in confinement.

They had been freely supplied with plenty of fresh sods,—of species of *Poa*, mostly *P. annua*,—and kept in an ordinary-sized cage.

Imagines, not having emerged from the three cocoons at the end of last month, the latter were opened and found to contain only dried-up larvæ which had undergone no further change. The cocoons were oval, made of earth and silk, and tough.

It appears to me the true position of *Stilbia anomala* amongst its congeners will only be realized in a future classification of Lepidoptera based on the development of their larvæ.

25, Endsleigh Gardens, N. W., Nov. 7, 1884.

[It will be seen that in the 'Entomologist' List of British Lepidoptera Mr. South has removed *Stilbia anomala* from the end of the Noctuæ, and placed it among the Caradrinidæ.—ED.]

ON THE URTICATING HAIRS OF SOME LEPIDOPTERA.

BY RICHARD SOUTH.

NEARLY twenty years ago, that is in the summer of 1865, a cousin of mine, the late Mr. William Calvert South, and myself were collecting moths in the neighbourhood of Kingsbury, where we met with several imagines of *Porthesia similis* (*Liparis auriflua*) at rest on an old fence. We each secured specimens, which we killed there and then, by a method involving the use of the thumb and index finger of the left hand. Some little time after leaving the *similis* fence I began to feel an unpleasant tingling about the eyes. This gradually increased, until at last it became almost intolerable. Further collecting was not in accord with my inclination for that day, so we set out on the homeward journey. Before I reached home my eyelids were considerably swollen, and large wheals appeared on the throat and neck. Altogether I was an object of pity and compassion, and continued so for a day or two. Curiously enough, my cousin, who had handled *P. similis* in the same way as myself, did not

suffer any unpleasant effects whatever. This fact would seem to render absurd any attempt to connect *P. similis* with the symptoms developed almost immediately after handling the insects in my case. Still I have always been under the impression that "the goldtail moth" was the cause of my discomfiture on that particular summer's day in 1865. I may say that I am glad that Mr. Joseph Anderson can so satisfactorily connect cause and effect as he has done in his note respecting the urticating properties of the imago of *Porthesia similis* (*Liparis auriflua*), Entom. xvii. 275. Mr. Anderson must not suppose that I rejoice in his misfortune; I am only glad that he so directly traced the irritation he experienced to its proper source.

I have several times collected larvæ of *Porthesia* (*Liparis*) *chrysorrhœa* and bred imagines therefrom. In collecting the larvæ I had of course to handle them, but I had no occasion to touch the cocoons, and when the imagines came out they were pill-boxed and transferred to the ammonia jar, only touching them in the process of pinning. No symptoms of irritation resulted from contact with either larva or imago of this species. Had I interfered with the cocoon, irritation might have ensued, but of this I am by no means certain.

Figuratively speaking, entomologists are not as a rule "thin-skinned." But as a fact, the cuticle of most people—entomologists or not—is more or less sensitive to irritants of any kind. I knew a man whose skin was so extremely sensitive that the immediate contact of a woollen under-garment therewith gave rise to symptoms analogous to "nettle-rash," if it did not indeed cause true urticaria. One individual may be far more susceptible than another to the urticating properties of certain Lepidoptera. Probably even the same individual may at some periods of his life be more prone than at others to suffer from contact with the larva, cocoon, or imago of urticating Lepidoptera. I should think that when one has been hard at work collecting, and the "pores of the skin" are freely opened, one would be very liable to experience the full irritating power of certain larval hairs, &c.

Since 1865 I have only once experienced anything like the torments inflicted on me by the *P. similis* imagines. The instance I refer to happened on my first introduction to the larva of *Bombyx rubi* in 1874. I had been picking up a large number

of those larvæ, and the exertion caused perspiration. After passing my hand across my perspiring brow, I had a repetition of the *similis* attack, but in a much milder form. Since then I have, nearly every season, taken up odd larvæ of *Bombyx quercus*, *B. rubi*, and *Odonestis potatoria*, and in every case have noticed that the tips of my fingers and thumb were thickly "felted" with the hairs of the larva handled. Since my *B. rubi* experience I have always been studiously careful not to touch my face or neck. At the same time, when my hands have been hot I have frequently found a slight itching between the fingers, but the hairs sticking into the thicker skin of the thumb and fingers, did not cause any itching in those parts.

Mr. Swinton, in 'Notes on the Urticating Property of the Hairs of the Larvæ of *Liparis auriflua* (*Porthesia similis*),' communicated to the Entomological Society of London, August 6th, 1879, expresses his opinion that the hairs of the larva are covered with a poisonous liquid, exuded from the scarlet warts on the hinder segments. This is the only suggestion I can find as to the probable cause of the intense irritation set up by the hairs of the larva of this species. Assuming Mr. Swinton to be right with regard to the hairs of the larva, what about the hairs of the imago? Are these also coated with a poisonous liquid?

The hairs of larvæ of the genus *Cnethocampa* are barbed (one species of the genus, *pityocampa*, was reported as occurring in Kent, in 1873-4), and possess great urticating power. The hairs of the larva are perhaps the most virulent, but the hairs of the imago, and even the dust of the web, are capable of causing great irritation. It may be supposed that the greater irritation of the larval hairs as compared with those of the imago or the dust from the nest, is due to their barbed points. Especially would this appear to be the case if, as I have been informed, irritation in its severest form is apt to return at intervals for years after contact with the hairs of the larva.

Whether irritant poisons are or are not introduced with the hairs, may afford matter for discussion; but it does not appear altogether unreasonable to suppose that the hairs in themselves—especially barbed hairs—are quite capable of producing a considerable amount of discomfort, if not absolute pain, when introduced liberally into the human skin.

That pain is, sometimes at least, due to other than mere

mechanical action of the hairs, is suggested by the following incident I remember to have read in an entomological work, the title of which does not occur to me at the present moment. A traveller in some part of South America picked up a large hairy caterpillar. In handling it he sustained something akin to an electric shock. This was given with such power as to render his arm useless for a time!

Other "big things" in the way of caterpillars with unpleasant urticating properties are found in Brazil. The greatest efforts of our stinging species are but puny, when compared with the very disagreeable way these Brazilian larvæ have of resenting any interference with their liberty, as the following extract from 'Pioneering in Brazil,' by Mr. T. P. Bigg-Wither, will show. Writing of a tribe of *phosphorescent* hairy caterpillars, the author says:—"The varieties of these caterpillars were legion. Their bodies were protected by triple coats of mail, that is to say they were covered with a hairy substance, which in some species took the form of moss, and in others of groups of stag antlers. To attempt to touch these creatures with the naked hand was a scarcely less hazardous undertaking than plunging one's hand into a live hornet's nest. Each hair, or point, has the power of inflicting a sting as painful as that of a certain venomous species of red ant very common in parts of the forest, so that, if by chance, as not unfrequently befel us when working on the *picada*, one of these caterpillars happens to drop off a tree on to the hand, or, worse still, on to the nape of the neck, the pain is almost unbearable, the spot on which the creature falls immediately becoming inflamed, and afterwards swelling up to a great size."

12, Abbey Gardens, London, N.W., December 9th, 1884.

ORIENTAL ENTOMOLOGY.

BY THE REV. F. A. WALKER, D.D.

THE accompanying observations are founded principally on the Appendices to my work, 'L'Orient,' March 1—June 30, 1882, as well as those to 'Nine Hundred Miles up the Nile,' November 3, 1883—February 9, 1884.

Of all butterflies that I noticed during my two expeditions to

the East, no species that may fairly claim to be termed Oriental proved so abundant as *Thais apollina* and *Danaïs chrysippus*, the former occurring in Palestine and Syria, during the months of March and April, 1882, and the latter in Egypt, during November and December, 1883; or I might state with correctness that these two kinds were the commonest of all, *Vanessa cardui* alone excepted. Both *Thais apollina* and *Danaïs chrysippus* are easy of capture, the former affecting the Plain of Sharon and slopes of the Mount of Olives, as well as the meadows in the vicinity of Baalbec and Shtora, and the latter frequenting the gardens at Heliopolis, the Island of Roda, and the grounds of the palaces and villas in the neighbourhood of Cairo. It is probably owing to the scarcity, comparatively speaking, of wild flowers in Egypt, that the *Danaïs* was generally found fluttering round the scarlet poinsettias, or settled on the gay blossoms of a large bed of zinnias, but rarely outside the region of cultivation, whereas the *Thais*, which I never saw till after reaching Palestine, disported itself on and among the variously-coloured vetches, the scarlet anemone, no less brilliantly tinted tulips (*Ranunculus asiaticus* and *Tulipa oculisolis*), Star of Bethlehem, and sundry other blossoms of the flowery plain or hill-side. Both *Thais* and *Danaïs* were, generally speaking, in good condition. Early spring is evidently the season for the former, late autumn and the beginning of winter the time for the latter species; but by the middle of January, on my return to Cairo, after three weeks' absence up the hills, colder weather had set in, and all butterfly-life, for the time at least, disappeared. A perfectly fresh specimen of *T. apollina* has a dark gauze-like appearance over the whole of the upper wings, and a primrose tint (with the exception of the red and dark blue of the ocelli that form the border) over the lower. In the case of a more worn individual the gauze-like appearance is the first to go, in one still more faded the primrose tint also, until the upper wings are nearly transparent, except for the three black spots which mark its affinity with the Apollinidæ. Whether or no the sexes are distinguished by the respective faintness or vividness of the markings is more than I have knowledge in this instance to say.

I was also fortunate enough to see six or seven specimens of *Thais cerisyi* in Syria and to capture three, two at Shtora and one at Baalbec. I attributed its scarcity to the fact that I was

too early in the field for this particular kind, but have had reason to correct this view, owing to Mr. Butler's informing me that I was too late, and that, on the contrary, it is on the wing before *T. apollina*.

Among Pieridæ *Aporia crategi* was decidedly the most common. So torpid was this insect on our arrival at Ephesus, on May 5th, that it could be taken with ease by the fingers in the course of the afternoon, off the abundant blossoms and flowering shrubs on the lower slopes of Mount Prion, as we ascended to the stadium and tomb of St. John, or else was only roused to settle again. *P. daplidice* has a tolerably wide distribution, occurring on the banks of the Jordan, and half-way between Jerusalem and Jericho, and in the bed of the then dried-up stream of the Sara-kisi above Philadelphia, and by its capture at Colonos and Cerameicus recalling classic memories alike of blind Œdipus and Antigone, as well as of the first year of the Peloponnesian war. *P. brassicæ* and *P. rapæ* occurred, but only sparingly. There were several specimens, but all female, of *Euchloë cardamines*, on or about the rock of the Acropolis. Of two foreign species, *A. belemia* and *A. belia*, I captured three of the former, namely, one at Beyrout and two between Jaffa and Latroon, and one of the latter in the bed of the Sari-kisi above mentioned. On the upper side both *A. belemia* and *A. belia* closely resemble *A. cardamines* female, but are both smaller insects, *belemia* decidedly so, and this butterfly has the green spots or blotches of *cardamines* replaced by stripes. *A. belia* and *A. cardamines* are more nearly alike, but the white between the green spots of *A. cardamines* is silver on the under side of *A. belia*.

Colias edusa, as a matter of course, was generally distributed, and *Gonopteryx rhamni* and *G. cleopatra* were both noticed. Neither species were plentiful; the former occurring at Shtora on April 18th; of the latter I captured a female at Alexandretta, on April 28th, and saw the males for the first time in June, among the highly-scented scrub vegetation of cistus, arbutus, myrtle, and heather, and subsequently in Corfu.

Three of the four European species of *Papilio* were captured, *P. machaon* at Smyrna and Ephesus, *P. podalirius* at Baalbec, and *P. alexanor* at Ephesus. Of this last-named kind this was the only specimen that I have ever seen alive, and a large one and in fine condition.

To come next to the Satyridæ, *Minois actæa* and *anthelea*, and *Satyrus semele* were common in Deceleia road to Laurinum and other places in the neighbourhood of Athens, as also *Arge titea* and *A. galathea* on the Acropolis and road to Eleusis. *A. titea* was rather the more abundant of the two, but the difference between these two species is not discernible on the wing. I also took one specimen of *Satyrus ida* in Corfu, and a *Ypthima*, species undetermined, at Alexandretta, of which last I regret I had only one indifferent specimen, as I have been unable to find it in the national collection, but can certify to its also occurring above the Nahr-el-Kelb.

Of Fritillaries I only captured five species: *Melitæa trivia* at Ephesus, *Argynnis lathonia* and *Melitæa athalia* at Philadelphia, *M. cinxia* at Belgrade, and *M. didyma* in Corfu.

The remaining butterflies may be briefly enumerated: *V. camilla* in Prinkipo, *Lycæna melanops* at Alexandretta, *C. phlæas* and *P. alexis* at Ephesus, and *Pamphila linea* and *alceæ* at the Acropolis, Athens; and, on my second visit to the East, two species of *Deudorix*, *Lycæna bætica*, *Tarucus nana*, and *Zizera*, possibly *Kassandra*, at the end of November and beginning of December, as well as *Pamphila nostradamus* in and about Cairo. *Lycæna bætica* and *Vanessa cardui* were also seen at Aboo Simbel. *Vanessas* were neither abundant in number, with the exception of *V. cardui*, nor in kind. The only rare insect that I came across of this tribe was a solitary specimen of *Grapta egea*, which I unfortunately missed, in the bed of the Sari-Kisi.

Of moths the number of species is very scanty, so far as my personal observation went,—to wit, *Saturnia pyri* at Beyrout, *Arctia villica* on the banks of the Meles, *Zygæna brizæ* in the Stadium and Pagæ, at Athens, and *Z. carniolica* in the Pass of Daphne, *Dasydia obfuscata* (Scotch annulet) at Alexandretta, *Venilia maculata* (speckled yellow) at the entrance to the Wady Ali, and, on my second journey, *Chærocampa celerio* at the New Hotel, Cairo, in December.

(To be continued.)

REMARKS UPON THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

IN Mr. Dunning's review in the 'Entomologist' (vol. xvii. p. 213) of this list, and his enumeration of the species mentioned in it, there is a clerical error which requires correction. Mr. Dunning states the number of Tortrices recorded in it to be 245, whereas the number really is 343, and this correction will bring up the total number of species in the list to 2080 instead of 1982, the whole number mentioned according to Mr. Dunning.

In any new edition of the list Mr. South will doubtless pay attention to the valuable suggestions contained in Mr. Dunning's critical review of it, but I would add for Mr. South's consideration one or two further remarks on the contents of his list. The genus *Aporophyla* of Guenée appears in two places, first among the *Apameidæ* (p. 6), and again among the *Hadenidæ* (p. 9). The genus *Calamia*, too, of Hübner, appears on page 5, and again on page 6.

In compiling his list in conformity with the law of priority, Mr. South appears to have overlooked the desirability of avoiding the same name for different insects. In Doubleday's list the same specific name was occasionally used to denote more than one insect, but these instances are few in number, viz., *comma*, *cratægi*, *ligustri*, *populi*, *quercus*, *rubi*, *urticæ*, and the insects denoted in Doubleday's list by the same specific name belong to different groups. Mr. South, however, appears to have considerably increased the inconvenience thus occasioned, for in over 70 cases the same specific name is applied in his list to different insects—often, moreover, to different insects in the same group, and in many instances with the same author's name following. The confusion that must necessarily ensue in the minds of young and indeed old entomologists, will be gathered from the following instances which are taken from the list, especially when it is borne in mind that entomologists are careless as to postfixing the name of the author to the specific name. For facility of reference I have numbered consecutively the species enumerated in Mr. South's list and indicate them accordingly:—

| | |
|------------------------------------|---|
| 32 <i>Æthiops, Esp.</i> | 1588 <i>Æthiops, Westw.</i> |
| 413 <i>Affinis, L.</i> | 1580 <i>Affinis, Dougl.</i> |
| 1012 <i>Ahenella, Zinck.</i> | 1801 <i>Ahenella, Wk.</i> |
| 1405 <i>Albipunctella, Haw.</i> | 1532 <i>Albipunctella, Hb.</i> |
| 1190 <i>Angustana, Hb.</i> | 1319 <i>Angustana, Hb.</i> |
| 1835 <i>Apicella, Sta.</i> | 2039 <i>Apicella, Sta.</i> |
| 1392 <i>Arcuatella, Sta.</i> | 2060 <i>Arcuatella, H. S.</i> |
| 506 <i>Argentula, Hb.</i> | 1836 <i>Argentula, Zell.</i> |
| 1586 <i>Artemisiella, Tr.</i> | 2011 <i>Artemisiella, H. S.</i> |
| 1777 <i>Auroguttella, St.</i> | 1793 <i>Auroguttella, Fisch.</i> |
| 556 <i>Autumnaria, Wernb.</i> | 679 <i>Autumnaria, Gn.</i> |
| 1365 <i>Avellanella, Hb., Sta.</i> | 1784 <i>Avellanella, Sta.</i> [Sta.] |
| 41 <i>Betulæ, L.</i> | 995 <i>Betulæ, Göze</i> 1787 <i>Betulæ,</i> |
| 1112 <i>Bifasciana, Haw.</i> | 1343 <i>Bifasciana, Hb.</i> |
| 3 <i>Brassicæ, L.</i> | 294 <i>Brassicæ, L.</i> |
| 1336 <i>Ciliella, Hb.</i> | 1526 <i>Ciliella, Sta.</i> |
| 64 <i>Comma, L.</i> | 247 <i>Comma, L.</i> |
| 1078 <i>Corticana, Hb.</i> | 1199 <i>Corticana, Hb.</i> |
| 221 <i>Coryli, L.</i> | 1959 <i>Coryli, Nic.</i> |
| 1488 <i>Costella, Fb., Sta.</i> | 1589 <i>Costella, Westw., Sta.</i> |
| 838 <i>Cratægella, Hb.</i> | 1468 <i>Cratægella, L., St.</i> |
| 2 <i>Cratægi, L.</i> | 164 <i>Cratægi, L.</i> |
| 130 <i>Cribrum, L.</i> | 974 <i>Cribrum, Schiff.</i> |
| 412 <i>Diffinis, L.</i> | 1562 <i>Diffinis, Haw., Sta.</i> |
| 46 <i>Dispar, Haw.</i> | 158 <i>Dispar, L.</i> |
| 1236 <i>Distinctana, Bent.</i> | 1284 <i>Distinctana, Hein.</i> |
| 1459 <i>Fasciellus, Fb.</i> | 1667 <i>Fasciellus, Hb.</i> |
| 252 <i>Flammea, Curt.</i> | 441 <i>Flammea, Esp.</i> |
| 1092 <i>Fuligana, Hb.</i> | 1114 <i>Fuligana, Haw.</i> |
| 996 <i>Fusca, Haw.</i> | 1762 <i>Fusca, Sta.,</i> |

And so on in seventy-six instances.

HILDEBRAND RAMSDEN.

26, Upper Bedford Place, Russell Square, W.C.,
December 8, 1884.

[We have referred the above communication to Mr. South, and append the following from that gentleman.—ED.].

Mr. Hildebrand Ramsden's remarks on my list offer me an opportunity of saying a few words. Firstly, in extenuation and explanation of an oversight in the matter of the two genera *Aporophyla* and *Calamia*. Secondly, in reference to Mr. Ramsden's observations on duplicate trivial names. Several gentlemen had already (Mr. Jos. W. Harris as early as August 18th, 1884) called my attention to the fact that the genus *Calamia* and the genus *Aporophyla* each occurred twice in my list. In my MS. list I had pencilled in *Calamia* above *lutosa*, and *Aporophyla* above *lutulenta* and *nigra*, thus indicating the genera in which these species occurred in 'Staudinger's List.' On

sending the MS. to the printers I omitted to erase the generic names written in pencil, and in revising the proof-sheets the repetition escaped my notice. I need hardly say that I regret having thus laid myself open to the charge of carelessness. Such an imputation one reviewer has in fact brought against me, and in evidence thereof refers to these unfortunate repetitions.

Apart from the inevitable strictures on my shortcomings, I did not suppose that my list would be accepted without comment. At the same time I may say that I was not prepared for such objections as Mr. Ramsden has brought forward in regard to specific names. Mr. Ramsden says that I appear to have "overlooked the desirability of avoiding the same name for different insects." With all due deference to Mr. Ramsden's opinion in this matter, I must confess that I fail to recognise the desirability of altering specific names so as to facilitate the use of such names only. To argue that a *Nepticula*, for example, should not bear the specific name of *arcuatella*, because a species of the genus *Scardia* already bore that name, is as illogical as to say that Smith's son should not be called John, because the son of Jones was already named John, and in after life confusion might ensue as to their identity, because they were both named John.

It does not appear to occur to Mr. Ramsden, that when two or three species bear the same trivial name, the generic name taken in conjunction therewith is of some importance in denoting the species we wish to refer to. He would seem to attach greater value to the author's name following the specific name. To speak or write of *comma*, L., would not convey any distinct idea of the species intended, but if we say or write *Hesperia comma*, L., or *Leucania comma*, L., we refer definitely to a species of Lepidoptera. It is a common practice of some lepidopterists to speak of the objects of their study by their trivial names only, and the generic name is never used by them if they can possibly avoid it, but "it is a custom more honoured in the breach than the observance."

I do not quite understand Mr. Ramsden where he says, "in over 70 cases the same specific name is applied to different insects." But in looking over the interesting list of duplicate and triplicate specific names he has been at the trouble of drawing up, I find that in 71 instances two insects bear the same specific name, and in 5 cases three insects have each the same specific

name. As an example of the frequent use of the same specific name in different genera, in other branches of Natural History, I may mention an instance in the latest standard work on British Fishes (Dr. Day's 'Fishes of Great Britain and Ireland') in which the trivial name *vulgaris* is indexed to no less than fifty-two genera, and this is by no means an isolated case.

RICHARD SOUTH.

12, Abbey Gardens, London, N.W.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*),

OPHELTES, *Holmgr.*

Fulvous; part of head and thorax and apex of abdomen black.

1. *glaucopterus*, 7—9 lines.

This fine species, of which the male is almost unknown (Entom. xii. 55), is not common in Britain. It is figured by Panzer (Schæf. Ic., pl. 82, fig. 3). It is a sawfly parasite, having been bred from the three species of *Cimbex*, thus being a conspicuous exception to the general lepidopterous parasitism of the Ophionidæ. Hartig, Drewsen, Reissig, Giraud and Brischke bred it from *Cimbex femorata (variabilis)*, Giraud from *C. humeralis (axillaris)*, and Siebold from *C. connata*; the latter from eggs deposited by a virgin mother (Ent. Nach., x. 95).

PANISCUS, *Schr.*

Almost entirely fulvous.

A. 1st segment of the abdomen hardly shorter than the hind coxæ and trochanters; aculeus of female about as long as the 1st segment (males and females).

a. Tarsi pale yellowish white, lighter than tibiæ. *tarsatus*, $4\frac{1}{2}$ — $5\frac{1}{2}$ lines.

b. Tarsi and tibiæ of the same colour.

* Sides of head behind the eyes, seen from above, parallel.

† Larger; elevated line before apex of metathorax.

1. *cephalotes*, 6— $9\frac{1}{2}$ lines.

†† Smaller; no elevated line before apex of metathorax.

fuscicornis, 3—5 lines.

** Sides of head behind the eyes slanting. - 3. *testaceus*, $4\frac{1}{2}$ —9 lines.

B. 1st segment of abdomen shorter than the hind coxæ and trochanters; aculeus of female hardly exerted; hind tarsi paler than tibiæ (male and female). - - - 2. *virgatus*, 3—5 lines.

The species of *Paniscus* are amongst the commonest of our Ichneumons, but they are rather difficult to distinguish; they bear considerable resemblance to the species of *Ophion* in many respects, but the neuration will at once distinguish them. *P. tarsatus*, Brischke (Trans. Ent. Soc. Lond., 1881, p. 157), and *P. fuscicornis*, Holmgr. (Entom. xvii. 67), are added to the species included in Marshall's catalogue. Neither species are uncommon in Britain, the former appears to be especially attached to the species of *Eupithecia*; its elongate, cylindrical, smooth, hard, black cocoon, with a narrow median pale band, is figured on plate ii., fig. 7. *P. inquinatus*, Gr., is omitted, as no author has referred to this species since Gravenhorst described the two females captured near Netley, by Hope; and he opines that their colour was not natural. It may either be a good species, or probably the same as Holmgren's *P. cephalotes*. Ratzeburg has figured the wing of *P. testaceus* at Die Ichn., vol. ii., pl. i., fig. 25, and see Vollenhoven's 'Schetsen,' pt. i., pl. ii., fig. 20. Boie mentions parthenogenesis in *P. testaceus*, in Wiegmann's Archiv., ii. 38. The life-history of *Paniscus* has already been fully referred to (Entom., xvii. 124; and see Ent. Nach., v. 221, 265); so we will here merely give the list of hosts:—

1. *cephalotes*, *Holmgr.*, from *Orgyia pudibunda*, *Pœcilocampa populi*; Brischke. *Dicranura vinula*; generally. *D. bifida*; Baker. *Acronycta tridens*, *A. psi*, *A. megacephala*, *Cucullia scrophulariæ*, *C. thapsiphaga**, *C. asteris*, *C. balsamitæ**, *C. artemisiæ**, *C. argentea**; Brischke.
2. *virgatus*, *Fourc.*, from *Odontopera bidentata*; Bignell. *Eupithecia absynthiata*, *E. sp.?* Brischke. *E. succenturiata*; Bignell. *Drepana unguicula*; Brischke. *Dicranura bifida*; (Richter) Grav. *Cosmia trapezina*; Bignell. *Hadena pisi*; Newport. *Catocala promissa*; Giraud, Brischke, Bignell. *Halias prasinana*; Brischke, Bignell.
3. *testaceus*, *Gr.*, from *Smerinthus populi*; Marshall. *Bombyx pini**; (Reissig) Ratzeburg. *Phigalia pilosaria*, *Nysia pomonaria**; Scharfenberg. *Eupithecia castigata*; Bignell. *Dicranura vinula*; generally, but often undistinguished from *P. cephalotes*, see Albin's plate xi. *D. bifida*; Brischke. *D. furcula*; Ratz. *Hybocampa Milhauseri**; Taschenberg. *Clostera anachoreta*; Vollenhoven. *Acronycta leporina*; Brischke. *A. psi*; Raynor, Warren. *A. megacephala*; (Perris) Gir. *Nonagria geminipuncta*; Flet-

cher. *Mesogona oxalina**; (Rogenhofer) Gir. *Hadena pisi*; Marsh. *H. dentina*, *Xylina rhizolitha*; Bignell. *Cucullia serophulariæ*; Siebold. *C. lychnitis*; (Goossens) Gir. *C. asteris*; Speyer. *C. argentea**; Brischke. ? *C. artemisiæ**; Grav. *Toxocampa craccæ*; Kriechbaumer. *Cimbex femorata*, *Clavellaria amerina*; Bouché.

fuscicornis, *Holmgr.*, from *Lithostege nivearia*; Raynor. *Leucania obsoleta*, *Anarta myrtilli*; Brischke.

tarsatus, *Brischke*, from *Eupithecia succenturiata*; Brischke. *E. castigata*; Brischke, Bignell. *E. virgaureata*; Bignell. *E. vulgata*; Fletcher. *E. absynthiata*; Brischke, Bignell. *E. lariciata*; Brischke, Bignell. *E. abbreviata*; Bignell. *E. exigua*; Brischke, Warren. *Drepana falcula*, *D. unguicula* Brischke.

ABSYRTUS, *Holmgr.*

Fulvo-testaceous; eyes and spot between the ocelli blackish (male and female). - - - - - 1. *luteus*, 3—3½ lines.

Holmgren described this genus and species in his 'Monographia Ophionidum Sueciæ' (p. 33); it does not appear to be rare. He there points out that it is mixed with *Mesoleptus testaceus* in collections. It is also much like *Paniscus virgatus*; but may be distinguished from the former by its pectinated claws; and from the latter by its subrotund metathoracic spiracles, and by the inferior tooth of the mandible being longer than the superior; the neuration of the wings also differs. The *Absyrtus* does not appear to have been bred.

CAMPOPLEX, *Grav.*

- A. Back part of metathorax concave (males and females).
- a. Abdomen entirely black.
 - * Scape of antennæ pale beneath. - - - 10. *myrtilus*, 5 lines.
 - ** Scape of antennæ not pale beneath.
 - † Legs yellow; coxæ, trochanters, hind femora, apex of middle femora, and base and apex of hind tibiæ black. - *nobilatus*, 6 lines.
 - †† Legs red; coxæ, trochanters, apex of hind tibiæ and tarsi dark. 7. *ebeninus*, 2½—4½ lines.
- b. Abdomen more or less red or yellow.
 - * Middle of abdomen and part of legs yellow.
 - † Spaces between the punctures of the mesopleura reticulate. 1 (part). *falcator*, 7½—10½ lines.
 - †† Spaces between the punctures of mesopleura smooth and shining. 1 (part). *oxyacantha*. 4—8½ lines.

- ** Abdomen and legs partly red or reddish yellow.
- † Hind femora entirely red.
- § Mesopleura in front with a vertical ridge.
- × Lower margin of 3rd segment of abdomen concave.
2nd and 3rd segments of abdomen with a brownish mark on the side.
5. *cultrator*, 8 lines.
- × × Lower margin of 3rd segment not concave.
Middle of abdomen red. - - - - *obreptans*, 4 lines.
- §§ Mesopleura in front without a vertical ridge.
Middle of abdomen red; 3rd segment without a lateral black streak.
juvenilis, 3½—4½ lines.
- †† Hind femora black, or partly black.
- o Hind tibiæ black; 3rd segment below not concave.
- Abdomen red; base and more or less of apex black; between the punctures of the mesopleura reticulate; no vertical ridge behind front coxæ. - - - - *erythrogaster*, 4½ lines.
- + + Middle of abdomen red; between the punctures of the mesopleura smooth, with a ridge behind front coxæ (male). *punctatus*, 5 lines.
- oo Hind tibiæ not entirely black, more or less red or reddish yellow.
- Mesopleura between the punctures smooth.
- ∞ Mesonotum between the punctures smooth. *bucculentus*, 5—6 lines.
- ∞∞ Mesonotum between the punctures reticulate.
- ' 3rd segment of abdomen more or less concave below.
- ! Abdomen in the middle widely, and legs yellowish or testaceous; coxæ, hind trochanters and base of femora black; mesopleura without a vertical line behind front coxæ. 3. *carinifrons*, 8—10 lines.
- !! Middle of abdomen and part of legs red; mesopleura with a vertical line behind front coxæ. - - - - 6. *nitidulator*, 6½ lines.
- " 3rd segment of abdomen not concave below (female). *rugulosus*, 8 lines.
- +++ Mesopleura between the punctures reticulate; transverse anal nervure divided below the middle.
- * 3rd segment of abdomen more or less concave below; forehead most frequently with an elevated ridge.
- † Mandibles and tegulæ black; aculeus of female long.
Middle of abdomen, greater part of front legs and middle of hind tibiæ red. - - - - *terebrator*, 5—6 lines.
- †† Mandibles pale; aculeus not long.
3rd, 4th, and sometimes 5th segments of abdomen red.
- † Transverse anal nervure of hind wings divided just below the middle; scutellum at sides margined almost to the middle.
- § 3rd, 4th, and 5th abdominal segments and part of legs red.
2. *pugillator*, 5½ lines.
- §§ 4th and 5th segments black. - - - - *unicinctus*, 7 lines.
- †† Transverse anal nervure divided almost at the bottom.
Post petiole with three longitudinal oblong depressions; middle of abdomen and part of legs red. - - - - *trisculptus*, 7 lines.
- ** 3rd segment of abdomen not concave below.
Mesopleura with a distinct vertical ridge behind the front coxæ.
- o Fovea of antennæ dilated above into a distinct ear-like process.
Middle of abdomen red; greater part of legs red. *anceps*, 5—5½ lines.
- oo Fovea of antennæ not dilated above.
- 1. Forehead above the antennæ furnished with several prominent vertical ridges.

- Middle of abdomen red; legs yellow, hind coxæ, trochanters, base and apex black; tarsi slightly brownish (male). *costulatus*, $5\frac{1}{2}$ lines.
2. Forehead without ridges above the base of the antennæ.
 ' Apex of hind femora red.
 Apex of 2nd segment, 3rd entirely, and extreme base of 4th chestnut (female); legs and abdomen of male paler, red colour more extensive. - - - - *femorator*, $7-7\frac{1}{2}$ lines.
- " Apex of hind femora not red.
 ! Middle of abdomen and greater part of front legs yellowish; middle of hind tibiæ broadly yellow; 3rd segment without a lateral black streak. - - - - *confusus*, $6\frac{1}{2}$ lines.
- !! Middle of abdomen red; legs partly red; 3rd segment with a lateral black streak; sides of metathorax moderately pubescent; groove of metanotum regularly transversely rugose. *tenuis*, $4\frac{1}{2}-5$ lines.
- B. Back of metathorax not concave (male and female).
 Middle of abdomen and legs partly red. 8. *leptogaster*, 4—5 lines.

Gravenhorst's original genus *Campoplex* has been broken up by Holmgren, in his 'Monographia Ophionidum Sueciæ,' into many subgenera, which may be arranged in two divisions—those having the metathoracic spiracles elongate, with one exception (*Charops decipiens*), forming the genus *Campoplex*; and those in which they are circular, subdivided into eight subgenera. Later, Förster divided his family *Campoplegoidæ* into sixty-two genera, in his 'Synopsis der Familien und Gattungen der Ichneumonen'; these have not been adopted. Förster's 'Monographie der Gattung Campoplex, Grv.' (Verh. z.-b. Ges. Wien, xviii. 761—876, pl. x.; 1869), and Holmgren's 'Om de Skandinaviska arterna af ophionidsläktet Campoplex' (Bihang Sv. Ak. Handl., vol. i., pt. 2, pp. 1–90), must be consulted for this genus; seventy-nine species are described in the former and forty-two in the latter paper. There is a very great similarity in the coloration of the species; Förster divided them into two groups according to the colour of the hind femora (red or black). Other distinctions are that the spaces between the punctures of the mesopleura are smooth or reticulate; at the front part of the mesopleura, just above the anterior coxæ, is an oblong depression into which the base of the front legs fits; this groove is sometimes smooth behind, or it is as it were separated from the mesopleura by a vertical ridge; the lower margin of the third segment of the abdomen is either convex or concave; the absence or presence of a lateral streak at the base of the third segment; the colour of the mandibles and tegulæ, &c. From these remarks it may be gathered that specimens of *Campoplex* gummed down on a card are almost

valueless. The best way is to set them lengthwise on a narrow strip of card not more than one-sixteenth of an inch wide, so that it does not project beyond the front coxæ, and pin the card; if the insect is pinned in the ordinary way, the slender compressed abdomen has a remarkable tendency to break off. Marshall's Catalogue enumerates twelve species. Of these *C. mixtus*, Gr., has been cut up. It is impossible to say what has not been included under *C. pugillator*. Of Desvignes' species the only true *Campoplex* is his *C. myrtilus*; his *C. henaultii* is certainly *Casinaria vidua*, Gr. and his *C. placidus* much resembles *Limneria vulgaris*, Tschek, or it may possibly be a *Casinaria*; it is not a *Campoplex*. *C. anceps*, Holmgr. (Ent. Ann. 1874, p. 143), *C. obreptans*, Först., *C. confusus*, Först., *C. erythrogaster*, Först., *C. terebrator*, Först. (Trans. Ent. Soc. Lond., 1882, p. 149), *C. bucculentus*, Holmgr., (Trans. Ent. Soc. Lond., 1884, p. 426), *C. nobilitatus*, Holmgr., *C. unicinctus*, Holmgr. (non Grav.), *C. trisculptus*, Holmgr., and *C. tenuis*, Först., are now known as British. *C. punctatus*, Bridgm., *C. costulatus*, Bridgm., and *C. femorator*, Bridgm., are new species. Holmgren says of *C. melanarius*:—"Haec species structura metathoracis et abdominis ad propriam subdivisionem forte rectius referenda" (Mon. Oph. Suec., p. 37); later he considered it a *Limneria*. Tschek includes it in *Sagaritis*.

For outline figure of *Campoplex* see Vollenhoven's 'Schetsen,' pt. i., pl. ii., fig. 19. The species of this genus appear to be exclusively parasitic on Lepidoptera (records to the contrary belonging to other genera), and their economy is somewhat peculiar, as the cocoon of the parasite is frequently spun under and concealed by the larva-skin of its host. Boie says his "*C. cajæ* emerged from the head of the young larva of *A. caja* at the end of June," but this may be a *Limneria*. Ratzeburg first noticed this. He says:—"The larva (of *Orgyia antiqua*) remained in good condition, but the parasitic larva (of *Campoplex carbonarius*) had gnawn through its belly and pupated in a white cocoon, which closely adhered to the leaf; and it emerged as an imago, through a hole in the back of the larva of about the size of a millet seed" (Die Ichn., i. 93). A similar case is figured on pl. ii., fig. 23, which represents the cocoon of *C. ebeninus* under the larva-skin of its host (*Orgyia fascelina*). Pl. ii., fig. 6, represents the hard, smooth, cylindrical, black-veined, brown cocoon

of *C. oxyacanthæ* ex *Himera pennaria*; and fig. 24 represents the cylindrical, woolly, drab cocoon of the same species ex *Fidonia piniaria*.

The following species have been recorded as bred; but, as has been said, their determination is sometimes uncertain:—

1. *mixtus*, *Gr.*, from *Orgyia pudibunda*; Brischke. *Biston hirtaria*, *Amphydasis prodromaria*; Bignell. *Pygæra bucephala*; Brischke, Marshall, Bignell, Norgate. *Notodonta camelina*; Osborne. *N. ziczac*; De Geer. *Acronycta* sp., *Cucullia argentea**, *C. sp.*; Brischke. *Anarta myrtilli*; Desvignes' Coll. *Halias prasinana*; Brischke.
falcator, *Thunb.*, from *Pygæra bucephala*; Norgate. *Notodonta ziczac*; Bignell.
oxyacanthæ, *Boie*, from *Himera pennaria*; Bignell, Brischke (*mesoxanthus*, Först.). *Fidonia piniaria*; Fitch. *Miselia oxyacanthæ*; Boie.
2. *pugillator*, *Gr.*, from ?*Aporia cratægi*; (Reissig) Ratzeburg. *Thecla betulæ*; Eedle. ?*Zygæna filipendulæ*; De Geer. *Z. rhadamanthus**; (Fallou) Giraud. *Odontopera bidentata*; Brischke. *Amphydasis betularia*; Bignell. *Gnophos obscurata*; Drewsen and Boie. *Corycia temerata*, Bignell. *Selidosema tæniolaria**; Gir. *Cheimatobia brumata*; Drewsen and Boie, Rothlieb. *Eupithecia abbreviata*; Bignell. *E. absynthiata*; Bignell, Wilson. *Anticlea rubidata*; Brischke. *Notodonta dictæoides*; Brischke. *N. ziczac*; Linné (query an *Anomalon*). *Gonophora derasa*; Rothlieb. *Cymatophora ridens*, *Tæniocampa populeti*; Bignell. *Heccatera dysodea*, *Cucullia* sp.; Brischke. *Heliothis marginata*; Boie. *H. dipsacea*; Gir. *Halias quercana*; Boie, (Perris) Gir. *Phibalocera quercana*; (Richter) Grav.
3. *carinifrons*, *Holmgr.*, from *Macaria æstimaria**; (Perris) Gir. Also bred by Bignell.
4. *validicornis*, *Holmgr.*, from *Eupithecia succenturiata*, *Cucullia artemisiæ**; Brischke.
6. *nitidulator*, *Holmgr.*, from *Eupithecia venosata*; D'Orville.
7. *ebeninus*, *Gr.*, from *Orgyia fascelina*; Holmgren, Harwood, Bignell. *Hyponomeuta evonymella*; (Siebold) Ratz.
carbonarius, *Ratz.*, from *Orgyia antiqua*; Brischke, Ratz. *O. gonostigma*; Brischke. *O. fascelina*; Bouché, Nördlinger, (Graff) Ratz. *Tæniocampa populeti*; Mrs. Hutchinson. *Tortrix xylosteana*; (Graff) Ratz.
8. *leptogaster*, *Holmgr.*, from *Cabera pusaria*; Brischke (not, teste Kriechbaumer), ? Boie (n. s. near *mixtus*, *Gr.*).

10. *myrtillus*, *Desv.*, from *Anarta myrtilli*; *Desvignes*.
anceps, *Holmgr.*, from *Eupithecia actæata**; *Brischke*.
bucculentus, *Holmgr.*, from *Odontopera bidentata*, *Lomaspilis marginata*, *Heliothis marginata*; *Brischke*.
confusus, *Först.*, from *Tæniocampa populeti*; *Bignell*.
rugulosus, *Först.*, from *Trachea piniperda*; *Norgate*.
erythrogaster, *Först.*, from *Hybernia rupicaprararia*; *Bignell*.
eurynotus, *Först.*, from *Thecla betulæ*; *Eedle*.
n.? sp., from *Tortrix forsterana*; *Elisha*.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEPIDOPTERA NEAR BROMLEY, 1883.—Mr. Watchurst's notes (*Entom.* vol. vii. p. 278) remind me of my own captures at light, at Lower Camden, between Chislehurst and Bromley, in 1883. I have already given a short list of some of the species taken up to August 15th (*Entom.* xvi. 233); an account of those taken after that date will perhaps prove interesting:—August 16th, a moonlight night, only *Plusia gamma* appeared. August 17th–27th, *Anaitis plagiata*, *Lophopteryx camolina*, &c. August 28th, the following appeared for the first time: *Noctua plecta*, *Triphæna comes* (*orbona*), *Luperina testacea*, *Noctua rubi*, *Cidaria silaceata*, *Melanthia ocellata*. With regard to the last, Newman merely states that it appears in June; is it usual to have a second brood? August 29th, *Eugonia alniaria* (*tiliaria*) and *Cidaria testata* appeared for the first time. August 30th, *Rumia luteolata* (*cratægata*), first appearance; took another *M. ocellata*. August 31st, first appearance of *Eupithecia oblongata* (*centaureata*) and *Charæas graminis*; got one of each. The following were also taken at light, at Chislehurst, between July 26th and August 31st, but I have no notes of the exact dates:—*Acidalia bisetata*, *A. dimidiata* (*scutulata*), *A. straminata*, *Eupithecia assimilata*, *E. linariata*, *Leucania conigera*, *L. impura*, *Hydræcia micacea*, *Miana arcuosa*, *Caradrina taraxaci* (*blanda*), and a single specimen of *Noctua triangulum*. I also obtained a number of *Micros*, but these I have not yet had time to work out. On July 13th the following came to light at Chislehurst:—*Porthesia similis* (*auriflua*), *Hadena oleracea*, *Boarmia gemmaria* (*rhomboidaria*), *Leucania lithargyria*, (two—one green and one brown one), *Hemithea strigata*, *Caradrina taraxaci*, *Plusia chrysitis*, *Noctua augur*, *Nomophila noctuella* (*hybridalis*), and a few others.—T. D. A. COCKERELL; 51, Woodstock Road, Bedford Park, W., December 8, 1884.

LATENESS OF THE PAST SEASON.—Mr. Harding remarks in the 'Entomologist' (vol. xvii. 185), that after every promise of a remarkably early spring, the bitter east wind of April changed the whole aspect of affairs, whereby the appearance of many species was greatly retarded. Having passed the summer months entomologizing in south-western Spain, I may note that I there observed three butterflies appeared much after the dates assigned in Mr. Kirby's books for their emergence. In the case of *Argynnis pandora*, a very common and conspicuous butterfly in north-western Spain, as *A. aglaia* is in Scotland, there could be no inaccuracy of observation, I think, involved. The newly-emerged males I first noticed in the environs of Valladolid, on the 12th of July, and the species was still flying in the Asturian mountain gorges in August. Kirby's book says June and July.—A. H. SWINTON; Binfield House, Waterden Road, Guildford, December 9, 1884.

[Dr. Lang, in his 'Butterflies of Europe,' also gives June and July as the time of appearance of *Argynnis pandora*.—J. T. C.]

ECONOMY OF COLIAS EDUSA.—The life-history of this species has been so far elucidated as to make it clear the deposition of eggs usually takes place about May, the work being performed by hibernated individuals, as in *Gonepteryx rhamni*. It is possible that in exceptional years a few larvæ might be produced in the autumn, which would pupate ere winter, as Mr. Tutt suggests (Entom. xvii. 270). That, from some peculiarity in the species, the hibernators are apt to die off, has been given as the reason why *C. edusa* is less abundant than *G. rhamni*, though much like it in some respects.—J. R. S. CLIFFORD; Cambrian Grove, Gravesend, December 11, 1884.

GONEPTERYX RHAMNI IN DORSETSHIRE.—I think that Mr. Mansfield (Entom. xvii. 271) is mistaken in thinking that buckthorn is not a Dorsetshire plant. Both the British species of *Rhamni* occur in a native state in the county, and the common buckthorn (*R. catharticus*) is widely distributed, and in some places frequent.—F. BUCHANAN WHITE; Perth, Dec. 9, 1884.

LATE APPEARANCE OF HEPIALUS HUMULI.—At the end of August I netted what I thought was a Noctua, flying oddly over the grass. To my great surprise it proved to be a female *H. humuli*. In so hot a season it could hardly be a late emergence,

as the species was quite over the month before. The specimen was in fine condition, but pale in colour, and very small.—J. SANG; 33, Oxford Street, Darlington.

ABNORMAL APPEARANCE OF *CUCULLIA VERBASCI*.—I was surprised to find a specimen of *Cucullia verbasci*, just hatched out, in my breeding-cage to-day. It is one of ten larvæ that I found in Hampshire, in July, 1883, all of which went into the pupa state the same autumn, but only three imagos have at present appeared. The two previous specimens hatched in June last.—PERCY RENDALL; 20, Ladbroke Square, November 21, 1884.

CIDARIA FLAVICINCTATA DOUBLE-BROODED.—Is *Cidaria flavicinctata* (*ruficinctata*) double-brooded generally? I procured some ova rather late this season in Rannoch. One larva rather quickly outgrew the others, but was by no means full-sized when it turned into a very small chrysalis. A few days ago it came out as a perfect and well-marked moth, rather small, but not much smaller than some I have taken in Rannoch; the others are all very tiny, but I hope to get them through the winter.—(Mrs.) ELIZABETH CROSS; Appleby Vicarage, Brigg, Nov. 27, 1884.

THE URTICATING PROPERTIES OF THE HAIRS OF *PORTHESIA CHRYSORRHŒA*.—At least I suppose we must say it is the "hairs," as stated (Entom. xvii. 275), that cause with some persons such peculiar and painful irritation, while others are slightly affected, and others, again, not affected at all. During some years, a long strip of hedge on the old Dover road, between Gravesend and the village of Chalk, was the residence of a colony of *Porthesia chrysorrhœa*, hundreds of their nests, or even thousands, being conspicuous on the hawthorn, blackthorn and hazel. By-passers of both sexes were often, in the summer months, sufferers from the hairs floated by the wind off the larvæ or their cocoons, and it was rather amusing to hear the various conjectures which were made as to the cause of the irritation, never attributing it to the insects on the hedges. I had, in a local journal, more than once advised the removal of these winter nests, in the interest of the adjacent orchards, seeing that this species is reported to be injurious to fruit trees. The farmers and gardeners neglected this, but the extremely wet winters of 1882 and 1883 appear to have extinguished the species for the present. Returning, however, to the matter of the urtication, I might say that, speaking

familiarly, there is not a pin to choose between the hairs of *P. chrysorrhæa* and those of *P. similis*, only from the occurrence of the former species in colonies we are more likely to perceive the disagreeable influence of their protective coating. The theory has been put forward (has it not?) that from the scarlet cup-like spot on the tenth segment of the larva a fluid is ejected which irritates, as in the case of *Dicranula vinula*, but I do not think this has been confirmed by dissection. It is amply proved that the cocoons cause irritation, as also the moths, concerning which Mr. Anderson's suggestion is a plausible one. The oddest circumstance is that the hairs of the larvæ seem to set up this irritation, not by puncturing the skin, but by simply lying upon it; of course the irritation once started, is generally increased by rubbing. Perhaps we may suppose that the hairs are beset with numerous fine particles, and these, falling off, are taken up by the pores of the skin. A lotion of arnica, applied cold, will probably be found the best remedy. It may be added that a similar effect has been experienced from the hairs of the larvæ of *Arctia caia* and *A. villica*.—J. R. S. CLIFFORD; Cambrian Grove, Gravesend. —December 11, 1884.

EXCHANGING.—Few of us can hope to form anything like a complete collection of British insects unless we have unlimited time and means at our disposal. Hence the necessity for your Exchange List, which is quite the recognised medium between collectors. The system under which exchanges are effected, among advanced collectors at any rate, is that of "marked lists." Now it is about these that I have a word to say. Does it not stand to reason, that when a collector has obtained full series of more than half the British species, the shortest method, both for himself and his correspondent, will be to place a mark against those species only which he wants? Instead of this, my experience is that if a friend wants, say two species out of a hundred, he will put his mark against ninety-eight and leave the two blank. Let such a person consider the waste of time thus caused to both contracting parties, and mend his ways. If any one knows the value of time, surely it should be an entomologist. To the four virtues required of us in the pursuit of any science—patience, energy, observation, and accuracy—may surely be added a fifth, appreciation of the value of time. In the good old days, when "exchanging" specimens first began, it was comparatively

common to see a notice from some prominent collector, offering certain species to be given away to those who would send box and return postage. How rare is such a display of generosity now-a-days! Is it that, twenty or thirty years since, there were so few entomologists that a collector found it difficult to discover "the" man who wanted a particular species; or is it that we are becoming more selfish? Whichever may be the true solution of this question, I do not think certain persons, who have almost complete series of what macros are obtainable, would be injuring their cabinets or themselves if they encouraged beginners or outsiders by distributing a few of their superfluous specimens without expecting a return of any kind. This is surely the best way of promoting our favourite pastime. — (Rev.) GILBERT H. RAYNOR; Shenfield, Brentwood, October 22, 1884.

DONACIA SPARGANII, *Ahr.* — While sweeping at Esher, on August 5th last, I netted a splendid coleopteron of the genus *Donacia*, and being doubtful as to which species to class it with, I kept it by me until Nov. 20th, when I exhibited several *Donaciæ*, including this one, at the South London Entomological Society's Pocket-box Exhibition. Several coleopterists were present, but as no one seemed to recognise the beetle in question I referred it to your correspondent, the Rev. W. W. Fowler, who kindly replied:—"The *Donacia* is *D. sparganii*, a good species; it is a pity you did not get more, as *Donacia* is usually a gregarious genus." Respecting the gregarious habit of this genus, it may be well to note that I have found this to be generally the case, although I captured but one specimen on the above date, but this is attributable to the fact that I had to suspend operations at noon, and consequently lost the latter portion of the day, which I consider the best time for collecting these beetles.—G. A. LEWCOCK; 40, Oxford Road, Islington, W., December 15, 1884.

CORRECTION.—PYRAMEIS HUNTERA NOT IN ESSEX. — I have pleasure in correcting a statement made by me (*Entom.* xvii. 41), through the medium of your Journal, that I had captured a specimen of *P. huntera* a few years ago; it turns out to be, as you surmised in your note, the variety of *V. cardui* figured in Newman.—F. H. BARCLAY; Leyton, Essex.

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PROTECTIVE RESEMBLANCES IN INSECTS.

BY ROLAND TRIMEN, F.R.S., &c.

Prof. Candèze has well observed that the main endeavour of every living being in nature is twofold, viz., on the one hand, to get enough to eat; and, on the other, to escape being eaten. To ensure this double object the most strenuous efforts are made; and it is obvious that, in such a competition for the means of existence, the slightest superiority or advantage must tell in favour of its possessor. Upon a very little difference in strength, swiftness, tenacity, weapons, acuteness of perception, or intelligence, the issue of life or death will depend, where there is enough for one but not for two, or when it is a question of hair-breadth escape from a devouring foe.

It is with regard to these all-important matters of obtaining a sufficiency of food, and escaping being fed upon, that the advantages of disguise and concealment become manifest. If the desert lion finds the advantage which his tawny hair gives him in stealing unobserved upon his prey, none the less does the desert antelope owe his safety to the isabelline colour of his coat. Nothing more strikingly illustrates the uses of concealment than the fact that in the wide unsheltered spaces where there is no cover of any description, all forms of animal life partake of the prevalent colour of the surface,—isabelline on the desert sands, pure white on the arctic snows.

Mr. A. R. Wallace, who has devoted great attention to this subject, and published some excellent papers dealing with it,

points out how very generally dwellers among leaves or grass are green; instancing the parrots and green fruit-pigeons among birds, the iguanas and tree snakes among reptiles, and the tree-frogs among amphibians, as prominent cases of the kind. Among insects numbers of species haunting herbage and foliage are green, notably in such familiar groups as grasshoppers and caterpillars.

From such general adaptations to surroundings as those just referred to, we may pass to that of a more specialized kind, which prevails very largely throughout Nature, embracing innumerable cases of more or less exact resemblance in colouring and in surface to inanimate or to vegetable objects. Peculiarities of the soil; of rocks and stones on its surface; of the bark of trees and shrubs; of mosses, lichens, and algæ; of leaves, flowers and stems;—are everywhere reproduced in the aspect of the animals respectively frequenting those objects. It is when absorbed in seeking or taking food, or when sleeping, that most creatures are specially exposed to danger, and it is manifest what protection must be afforded them by more or less similarity to the things about them.

The instances noticed are but samples of the large number known amongst vertebrate animals; and when we proceed to review the vast class of insects and their allies, so numerous are the cases in point that the difficulty is which to select as illustrations. The colour of the bare ground is reproduced in many beetles—in South Africa notably by Curculionidæ and Heteromera,—and in a multitude of grasshoppers and locusts. Some of the latter groups are exactly of the tint of the ground they haunt, so that it is next to impossible to see them as long as they remain motionless. The most specialized case among those known to me of this kind is that of the wingless Acridian genus *Batrachotetrix*, which has more than one representative in South Africa. The best known species, *B. bufo*, has been dubbed the “Stone Grasshopper” by Mrs. Barber, and well deserves the title; for in colouring, granulation of surface, and the singular flatness of the back, it precisely resembles the small stones which lie about on the surface of the ground which it frequents. In a locality near Grahamstown, where this species was numerous, Mrs. Barber and myself found it most difficult to detect the insect, as it was remarkably sluggish, and hopped but feebly.

and reluctantly even when we literally kicked it up. A circumstance most worthy of note is that the colouring of this curious grasshopper copies that of the particular little group of stones among which it lives; and I found this to be the case in quite a limited extent of ground, a set of mottled stones occupying a small space having among them *Batrachotetrix* of corresponding tints, while but a little way off a set of uniformly dark or light stones harboured grasshoppers of like hues.

Several South-African butterflies are protected at rest by the similarity of the under-surface of their wings to the ground on which they settle. The beautiful *Junonia cebrene* and *J. clelia* are thus often rendered almost invisible; and as the former species has been observed by Colonel Bowker to be much hunted by lizards, no doubt the resemblance is of considerable service to them. The same kind of protective colouring is shown by many of the small butterflies belonging to the genus *Zeritis*—a very characteristic Cape group.

The bark of trees and the lichens which cling to it find innumerable faithful copyists among insects, whole groups of beetles and moths more or less exactly reproducing each rugosity and tint of their wonted resting-place. The most practised collector will frequently fail to distinguish the best disguised of these insects, which to ordinary eyes are practically invisible.

Mr. Wallace records his obtaining in Borneo one of the "Spectres" or "Walking-stick Insects" (of the orthopterous order), which was covered with foliaceous excrescences of a clear olive-green colour, so as exactly to resemble a stick grown over by a creeping moss or *Jungermannia*. Quite as marvellous an imitation is the widely-known one of the "Leaf Insects" *par excellence*, a genus of the same family, many species of which occur in the islands of the Malayan Archipelago; and it is difficult to believe without close inspection that these species of *Phyllium* are not in reality the leaves of the plants on which they live. In the Karroo districts of this colony there occurs not uncommonly a very fine Walking-Stick *Phasma* (*Palathus haworthii*), attaining a length of seven or eight inches, which in its quiescent condition precisely simulates the dried-up rough greyish-brown twigs of the dwarf shrubby plants characteristic of the country.

The whole order of the Orthoptera is remarkable for the

likeness to vegetation which very many of its members present, even the predaceous *Mantidæ*, or "Hottentot Gods," affording numerous examples, some of which are very striking. One Natalian species *Phyllocrania paradoxa*, is almost as close an imitation of dead leaves as *Phyllium* is of living ones; while the young of *Harpax ocellata*, sent to me alive from D'Urban by Col. Bowker, have an extraordinary resemblance to a purple flower of the composite type. In this latter instance the resemblance is brought about by the position of the flat round abdomen, which is turned upward and backward over the hind and middle parts of the thorax, so that its lower surface, set with a central row and double lateral rows of purple foliaceous expansions, is fully exposed. This case of *Harpax* resembles that mentioned by Mr. Wallace of a Javanese Mantis which exactly resembled the pink flower of an orchid.

We can readily perceive the advantage of this harmless plant-like appearance to such voracious devourers of other insects as the *Mantidæ*, whose habit it is to remain motionless among vegetation until some unwary prey comes within reach of their long spiny arms.

As already mentioned, the unarmed race of butterflies and moths depends largely upon protective colouring, which, in accordance with the different posture of the wings in repose, is disposed in the former on the under-surface of the hind wings and of such part of the fore wings as is exposed, while in the latter it characterizes the upper surface either of all the wings or of the fore wings only. In South Africa I have noticed various butterflies possessed of this kind of protection in a high degree; such as, for instance, *Melanitis leda*, which rests among dead leaves on the ground in shady places, and is then indistinguishable from them; and the female *Eronia leda*, which settles on the faded bright yellow leaves of the *Erythrina* tree. Mrs. Barber noticed, near Grahamstown, quite similar behaviour in the conspicuous male *Papilio cenea* (*Merope* auct.), which twice deliberately settled in her garden, as a resting-place during a shower of rain, on a shrub whose yellow and brown seeds and flowers entirely resembled the colouring of the under side of his wings.

But by far the most elaborate imitation of this kind among butterflies is the famous one, so well explained by Mr. Wallace,

of the Indian and Malayan *Kallima inachis* and *K. paralekta*. In these species, which on the upper side are deep-blue and orange, the under side copies with perfect accuracy the withered or shrivelled leaves of dead trees or bushes, the imitation going into such details as to reproduce in appearance even the minute fungi or moulds that grow on the leaves! But this is by no means all the extent of the mimicry; the shape of the wings when the insect is at rest exactly representing both the pointed apex and the foot-stalk of the leaf, and the attitude assumed both bringing into prominence these details and concealing such parts as the head and antennæ which might impair the completeness of the deception. To give an idea of the exactness of the imitation, I may mention that Mr. Wallace had a case (which he showed to me) containing one of these butterflies with expanded wings and a number of other specimens at rest in their natural attitude on a branch. When this case was exhibited to anybody not specially acquainted with such matters, it was his wont to ask how many butterflies were in it, and the answer would always be "One"—meaning the conspicuous blue-and-orange individual with outspread wings. Mr. Wallace would then explain the imitation, showing that the apparent leaves on the branch were actually butterflies. But he had cunningly left one real leaf among them, and when, after explanation, he would say, "How many butterflies do you count now?" I believe that almost invariably the answer gave *one too many*, because the real leaf was counted by the spectator as one of the butterflies!

The numerous disguises assumed by Spiders have formed the subject of a special paper by Prof. Pavesi (Atti d. Società Ital. d. Scienze Naturali, vol. xviii., 1875), and among them some of the most interesting are those presented by hunting or wandering spiders, which do not construct webs for netting prey, but trust to their activity or patience. Many species of *Thomisus* are well adapted to succeed by being coloured in resemblance to the flowers in or on which they await the arrival of their victims. One that inhabits Cape Town is of the exact rose-red of the flowers of the Oleander; and, the more effectually to conceal it, the palpi, top of cephalothorax, and four lateral stripes on the abdomen are white, according remarkably with the irregular white markings so frequent on the petals of *Nerium*.

I was led to notice a yellow spider of the same group, in consequence of seeing that two of a number of butterflies on the flowers of *Senecio pubigera* did not on my approach fly off with their companions. Each of these unfortunates turned out to be in the clutches of a spider, and, when I released them, I observed their captors very narrowly, and found that the latter's close resemblance to the *Senecio* flowers was not one of colour alone, but due also to attitude. This spider, holding on to the flower-stalk by the two hinder pairs of legs, extended the two long front pairs upward and laterally. In this position, it was scarcely possible to believe that it was not a flower seen in profile, the rounded abdomen representing the central mass of florets, and the extended legs the ray-florets; while, to complete the illusion, the femora of the front pair of legs, appressed to the thorax, have each a longitudinal red stripe which represents the ferruginous stripe on the sepals of the flower.

On another occasion I witnessed the actual capture of a small blue butterfly (*Lycaenesthes*) by a white spider of the same genus. The butterfly was engaged in honey-sucking on a white flower-head of *Lantana*, and explored each individual flower with its proboscis. While I was watching it, the butterfly touched and partly walked over what looked like a slightly faded or crumpled flower about the middle of the cluster. This turned out to be a spider, which instantly seized the butterfly, throwing forward its front legs somewhat after the fashion of a Mantis. In this spider the effect of the little depressions on the limb of the corolla was given by some depressed lines on the back of its smooth white abdomen.*

LIFE-HISTORY OF *CHARAGIA VIRESCENS*.

BY GEORGE VERNON HUDSON.

AMONG the very few Bombycina inhabiting New Zealand, the family Hepialidæ occupy by far the most prominent position, comprising many insects of very large size and conspicuous appearance; of these perhaps *Charagia virescens* is one of the

* Part of an address delivered at the Annual Meeting of the South African Philosophical Society.

best known, whose life-history I briefly describe in the following paper.

The larva of this insect, unlike most of its family, tunnels the stems of living trees, feeding entirely on wood, which it bites off with its strong mandibles. The plant most usually selected by the caterpillar is *Aristotelia racemosa*, called by the settlers "New Zealand currant," from its large clusters of rich-looking black berries which appear in autumn; in all other respects it does not in the least resemble currant, reminding one more of a tall cherry tree. Other food-plants are numerous, the "black maize" (*Olea apetala*) and "manuka" (*Leptospermum*) being among those more frequently chosen. This larva for the most part inhabits the main stem of the tree, its gallery always having an outlet to the air, which is covered with a curtain of dull brown silk spun exactly level with the surrounding bark, and consequently very inconspicuous; these burrows usually run down towards the ground, and are mostly two or three inches from the surface of the trunk. In some instances the larvæ inhabit branches, in which case, if they are of small dimensions, the tunnels are made near the centre of each. These notes only refer to galleries constructed by young larvæ, as the tunnel made by the insect prior to becoming a pupa is of a very complicated character, and merits a somewhat detailed description; it consists of a spacious, irregular, but shallow, cavity just under the bark, having a large opening to the air, which is entirely closed with a thin silken covering almost exactly the same shape and size as the numerous scars which occur at intervals up the trunks of nearly all the trees. Three large tunnels open into this shallow cavity; one in the centre, which runs into the middle of the stem; and one on each side, which run right and left just under the bark. These are usually very short, but sometimes extend half-way round the tree, and occasionally even join one another on the opposite side. The central tunnel has a slightly upward direction for a short distance inwards, which effectually prevents it from becoming flooded with water; afterwards it pursues an almost horizontal course until it reaches the centre of the tree, when it appears to suddenly terminate. This, however, is not the case, for, if the gallery floor is carefully examined a short distance before its apparent termination, a round trap-door will be found compactly constructed of very

hard, smooth silk, corresponding with the surrounding portion of the tunnel so exactly that it almost escapes detection. When this lid is removed a long perpendicular shaft is disclosed, which runs down the middle of the tree to a depth of fourteen or sixteen inches, and is about six lines in diameter; at the bottom of this the elongate *virescens* pupa sleeps quietly and securely in an upright position, the old larval skin forming a soft support for the terminal segment of the pupa to rest on. The upper end of this vertical shaft is lined with silk, which forms a framework on which the trap-door rests when it is closed; the lid itself, being of a larger size than the orifice, which it covers, causes it to be extremely difficult, if not impossible, to open from the exterior, especially when it fits down very closely, which is nearly always the case as long as the insect remains in its burrow. The object of this most ingenious contrivance is in all probability to prevent the ingress of insects; Blattæ, slugs, spiders, and immature "wetas" (*Hemideina*) are frequently found in both central and lateral tunnels, but they are quite unable to pass the trap-door, and are most likely entirely ignorant of the existence of the vertical burrow. When the pupa has left its dwelling it becomes the permanent home of these animals and many others; I have on several occasions found a small orthopterous insect (*Libanasa* (?) *maculifrons*) in the vertical portion of deserted galleries, which has very long antennæ, and is agile in the extreme, leaping out of sight if possible the moment the tunnel is opened; it is a most graceful little insect, and I have never discovered it in any other situation, so conclude that this is its normal habitat.

The galleries of different individual larvæ are all wonderfully alike, the only differences observable being in the length of the perpendicular shaft and direction of the horizontal burrow, which is sometimes curved. These variations are usually caused by the presence of other tunnels in the tree, which the larva invariably avoids, although how the insect can ascertain that he is approaching another tunnel, before he actually reaches it, I cannot understand; I have never known a single instance when a larva has allowed his tunnel to communicate with a neighbouring one, whether inhabited or otherwise.

The caterpillar, when full-grown, is of considerable size, measuring from twenty-eight to thirty lines or more in length;

it is tolerably uniform in thickness throughout, and of a dull yellow colour. The head is large, dark chestnut-brown, very irregularly striated, and covered with a few short yellow bristles. The prothoracic segment is hard and shining, with the back and sides ruddy brown, the ventral surface being dull yellow; its spiracle, which is very large, is situated near the posterior margin, and a little above it there is a dull black spot, filling a slight concavity about the same size as the spiracle itself. The second and third thoracic divisions are without breathing orifices, all the rest of the segments, except the last, being provided with a pair situated in the connecting membrane between them. Each of these has on its dorsal surface two corneous plates of an oblong form with rounded angles, the larger of which is situated on the anterior portion of the segment, except on the second thoracic, where the arrangement is reversed, the smaller one being in front of the other. These plates are all divided into two portions by a dorsal line of soft membrane which runs down the middle of the larva. On the sides of the two posterior thoracic segments there are several small plates of irregular shape resembling those on the back; on each of the abdominal segments there are also two plates of an oval form situated just below the spiracles, and lying one above the other; these are all bright ochre in colour, hard, and shining. The anal segment is entirely corneous, and dull brownish yellow in colour. Prolegs are situated on the third, fourth, fifth, and sixth divisions of the abdomen; they are of a dull yellow hue, and are furnished with a row of very fine black hooks round the edges of that portion applied to the ground. Anal prolegs darker. The whole insect is sparingly covered with isolated yellow and black bristles. In many larvæ the ventral surface and connecting membrane between the horny pieces is light purple. Younger specimens principally differ in being of an olive-green colour, which is considerably darker when they are very small.

The last act performed by the caterpillar previous to undergoing its transformation is the construction of the trap-door at the top of its burrow; this done the insect retreats to the bottom, its last segment resting on the termination of the vertical gallery; after this it becomes torpid and stiff, then violently wriggles, and the skin, splitting open on the thorax, is worked

down to the bottom of the burrow underneath the last abdominal segment of the pupa.

The chrysalis of this insect varies much in size, ranging from twenty-four to thirty lines in length; it is of a very attenuated form, the widest portion being through the middle of the thorax; behind this it gradually tapers off towards the extremity, with the last segment abruptly truncated. Its colour is light ruddy ochre, with the head and dorsal portion of the thorax dark brown, and harder than the rest of the body. The edges of the abdominal segments are furnished dorsally with a row of small hooklets above and below all the dividing sutures; on the ventral surface there is only a single one, which is situated in front of each articulation.

As development progresses in the pupa it becomes darker in colour, especially on the wing-cases, which in some individuals show the future black markings of the moth as early as two months before emergence; others remain quite white and soft, the green wings suddenly appearing through their cases a fortnight or three weeks prior to the bursting forth of the imago. Previous to this change the pupa works its way up the vertical tunnel, forces open the trap-door, which yields to the slightest pressure from within, and wriggles along the horizontal burrow until it reaches the air, the last three or four segments only remaining in the tree. The thoracic shield then ruptures, and the moth crawls out and expands its wings in the ordinary way, resting on the trunk of the tree until they are of sufficient strength and hardness for flight.

Although nearly all the "currants" in this locality are perforated by the larvæ of *C. virescens*, I have never yet found a living example in the open, and only twice have discovered remains of them; once a dead crippled specimen at the foot of a tunnelled tree; on another occasion I found a pair of wings belonging to this moth in the middle of a road near Palmerston North. This specimen had evidently been devoured by some bird like its British relative, *Zeuzera æsculi*, whose wings we so often observe on footpaths in the vicinity of London.

Previous to the present year the obscure habits of this insect have prevented me from rearing the moth in captivity, and it was not until I had destroyed several examples of both larvæ and pupæ that I discovered the true nature of its burrow.

Since these preliminary disasters I have succeeded in extracting over twelve specimens, six of which died from time to time, three others have just appeared as moths, and the remainder are still alive and healthy, although exhibiting no signs of emergence at present. I therefore conclude that this insect is very delicate in its constitution, taking as I did every precaution with the pupæ, which were placed on rotten wood and covered with a thin layer of damp moss; a similar proportion of deaths occurring among chrysalids in the natural state would be almost sufficient to account for the apparent rarity of the imago.

I will now give a short description of the moth when recently emerged, as most examples seen in collections are so much faded, and frequently mutilated, that very erroneous notions are often entertained respecting the insect's natural appearance.

The fore wings of the male are uniform apple-green in colour, with a series of fainter oval markings, between the longitudinal veins, enclosing a dark green kidney-shaped spot in the centre of each; there is also a diagonal row of obscure white spots near the disc of the wing, and a somewhat conspicuous spot on the costa close to the thorax, of the same colour. The posterior wings are much paler, especially near the body, where they become almost white. The head and thorax are dark green, without markings; the abdomen is white and downy, becoming pale green at the apex, and the antennæ are very minute, of a rusty yellow colour. The legs are robust, dark green striped with blackish purple; the expansion of the wings ranges from three and a half to four inches. The female differs principally in having the wings of a more attenuated shape; the anterior pair are also ornamented with a number of black spots, chiefly situated on the costa, but extending across the wing to its posterior margin near the body. The hind wings differ from those of the male in being light greenish brown, and the basal portion of the abdomen is of the same colour, fading off into dark green on the two terminal segments. The expansion of the wings in this sex varies from four and a half to five and a half inches.

Notwithstanding its large size and conspicuous appearance this is not at all a beautiful insect, its long abdomen and minute antennæ giving it an ungainly and incomplete aspect which is far from pleasing even in the finest specimens.

Before finally concluding this paper I wish to direct the attention of your readers to some caterpillars preserved in the British Museum, and labelled "Larvæ of *Charagia virescens* attacked by a parasitic fungus." These insects are to be found buried in the earth, the fungus growing up out of the ground like a small plant. I have never discovered specimens myself, but have examined several obtained by others; in all these the parasite grew out of the connecting membrane between the head and prothorax, and projected somewhat forwards; the larvæ are also much shrivelled, and consequently unrecognisable; but being found invariably in the earth and not in the stems of trees, it seems more probable that they are the subterranean larvæ of one of the other large Hepialidæ than those of the present insect. I have never heard of infested specimens being found alive, or anything at all resembling them; but as no systematic research has been at present brought to bear on the subject it is impossible to say to what species they belong, especially as the most absurd ideas are entertained by many persons respecting the origin of the fungus, some positively asserting that the caterpillar devours the seed of the "rata" tree (*Metrosideros robusta*), and then buries itself, the young tree afterwards growing up out of the larva which it destroys!

Karori, Wellington, New Zealand, August 31, 1884.

A YEAR'S WORK AMONG GALL-GNATS.

BY PETER INCHBALD, F.L.S.

WE learn from Bergenstamm's pamphlet on the Gall-gnats, 'Synopsis Cecidomyidarum,' published in Vienna, in 1876, that 606 species, *duly named*, exist in the world. A very large proportion of these Cecidomyidæ occur in Europe, and of these 75 have been tabulated by Mr. Fitch as having been noticed in Great Britain. I would draw attention to his admirable Synopsis, which appeared in the 'Entomologist,' July, 1880 (vol. xiii., pp. 146-154). Mr. Fitch has taken Bergenstamm's Synopsis as his model, but his own personal experience has given additional interest to his list, and his introductory remarks should be diligently read and studied by every investigator of Cecid-life.

I have pleasure in submitting to your readers my year's doings among this most fascinating group of insects, and could only wish that I had more to record than I have. Long years are needed to elucidate fully the habits of these tiny gall-makers among our Diptera.

The first Cecid of the year is the little gnat that comes forth from the last year's catkins of the birch (*Cecidomyia betulæ*). I have reared them abundantly both this season and last. They appear in March, or early in April, if the morning is sunny. The contorted wings are unfolded in about twenty minutes, when they begin their merry gnat-like dance. You must be an early riser to notice the transformation scene.

No sooner does the cuckoo-flower (*Cardamine pratensis*) show its flower-buds than they are tenanted by the larvæ of *Cecidomyia cardaminis*, half-a-dozen or more occupying one bud, and making it assume such monstrous proportions as sometimes to be hardly recognised as the bud of our bonnie cuckoo-flower. After years of failure I succeeded this year in raising the gnat from the affected flower-heads of last year. Moisture is essential for its development; so that the flowerpot that contains the larvæ should stand in a saucer constantly supplied with water. I know no other secrets in rearing this merry little Cecid. Winnertz says that he only reared it after long years of disappointment. As the summer comes round, another gnat-gall covers the surface of the leaves of the meadowsweet (*Spiræa ulmaria*) with red and green warts. These are the home of the larvæ of *C. ulmariae*, and an abundant progeny may be reared therefrom by closely imitating Nature in her ways and means. The warts of this species are rounded on the obverse, pointed on the reverse, of the leaf. Each contains a single larva. July is the month in which they appear in the winged state, the first flight appearing about the middle of the month. I must have reared fully a hundred.

It is well to remember that the Cecids, as a group, are lovers of moisture, so that it is necessary, to succeed in rearing them, to sprinkle the food-plants with water each morning. Professor Loew (of Posen) remarks, in his monograph on the Cecids, that the larvæ of these minute forms of insect-life may be resuscitated even when apparently dead and shrivelled. This remark has often helped me, in my investigations, in educing the perfected existences.

Our ash-trees in Yorkshire have this year been affected by a Cecid larva that causes sausage-like swellings in the midribs of the leaflets. Bremi of Zurich figured the galls in his Monograph in 1847, though he did not rear the gnats. The reddish larvæ lie ensconced in the sausage-like gall, two or three in continuous succession. When full-fed in September and October the gall splits longitudinally, and they drop to the ground, burrowing into the soil. I hope to rear the gnats next year about the time the ash puts forth its leaves. The name of the Cecid is *Diplosis betularia*. I reared this year, in fair abundance, *Cecidomyia veronicæ* from terminal galls of *V. serpyllifolia*. The economy of the larva is identical, the terminal leaves of the shoots being inspissated, and adapted to the rearing of the offspring. I had some hope that the respective occupants of the nidus might be distinct, but Dr. Meade pronounces them identical. The densely hairy pouch of *V. chamædrydrys* resolves itself into a perfectly smooth pouch in *V. serpyllifolia*, as might naturally be expected.

Everyone must have noticed, in his walks in the country, the leafy bosses on the top shoots of our quickset hedges. These contain several larvæ of the *C. cratægi*. The metamorphosis is mostly external, though occasionally the larva pupates within the boss itself, as Mr. Fitch remarks. I have not yet reared this Cecid, though recorded years ago by Walker. I hope to be successful in the spring of next year, probably in April. The leaves are thickened by the ovipositing of the gnats, and thus made to supply food and shelter to the reddish-coloured larva, which feeds otherwise unprotected within the leafy tuft. Numbers pupated in my glass-topped box among the soil.

Another Cecid I have often tried to rear, but unsuccessfully, is the *C. urticæ* which is so commonly noticed in our lanes and hedgerows in the earlier stage of existence. The metamorphosis again is external, and hence the difficulty of rearing the gnats. The colour of the larva is green, I believe, in all the stages of its growth. I have tried another process of treatment this year, and hope to succeed, as it has not unfrequently been bred in this country, as well as in Europe. I naturally look for it in the spring months. These tiny gall-gnats need constant care in the rearing of them, more especially of those that pupate in the soil. With those that pupate in the gall itself it is mostly otherwise.

ORIENTAL ENTOMOLOGY.

BY THE REV. F. A. WALKER, D.D.

(Continued from p. 9.)

DURING my first visit to the East I captured 38 species of Coleoptera in Greece, 34 in Asia Minor, 21 in Syria, 18 in Palestine, 15 in Turkey, 7 in Egypt. On my second expedition I only captured 8 species of Coleoptera, 5 in Egypt and 3 in Nubia.

The difference in the number of species respectively noticed in the different countries may possibly be attributable, to some extent, to the time of year when the various localities were visited; and there are additional grounds for entertaining this hypothesis in the fact that the later the period the larger the number of species proved: for example, 7 in Egypt (in the month of March), 18 in Palestine (March—April), 21 in Syria (April), 34 in Asia Minor (May), and 38 in Greece (May—June). Only 13, it is true, were noticed in Turkey in the month of May, for the simple reason that a great part of my time was spent in visiting the public buildings, instead of in the open country. The genus *Oxythyrea* had a wide range, occurring alike in Palestine, Syria, Asia Minor, Turkey, and Greece. Two species of this tribe were found in great abundance, viz., *cinctella* and *hirtella*, and for the most part, as was also the case with many of the Cetonias, when tightly ensconced in the middle of a flower. I never saw any kind of beetle anywhere in such countless profusion as the showy orange and black-spotted *Mylabris quadripunctata*, on the ears of ripe corn, during our return drive from Deceleia on the 1st of June, at the close of a bright and hot day. Some few good sorts were found beneath stones; seven specimens, for example, of the rare *Nebria hemprichii*, at Aceldama, on April 3rd, and *Chlænium spoliatus*, *C. vestitus*, *Anchomenus austriacus*, and such like metallic Coleoptera on the wet ground in the vicinity of the Great Bend or reservoir of Sultan Selim, that had recently overflowed its boundary on the 25th of May, at Belgrade. *Anthia sex-maculata* (variegated black and white) is the handsomest, decidedly so, of the very few species I saw in all Egypt, and was taken running about the sand heaps that are silted up by the action of the desert winds,

around the clumps of tamarisk at El Ferdane and elsewhere, in the neighbourhood of the Suez Canal. *Ateuchus sacer* (the Scarabæus of the ancients) was found also in the Desert, and at the Pyramids of Geezeh, but far more plentifully on the road to Laurium and Marathon, two and a half months later.

Of the eight species of Coleoptera that I came across on my second visit to Cairo, and in my voyage up the Nile, one kind only was plentiful, *Steraspis squamosa*, one of the green metallic Buprestidæ, and of this bright-coloured beetle there were any amount, as it swarms on the tamarisks (January—March) at Erment, the ancient Hermopolis, a short distance up the river south of Luxor; and at this latter place a large number had been stored since the preceding season, in a terra-cotta gourd, for sale to tourists in December.

Respecting Orthoptera there is comparatively little to relate. I discovered the red variety of *Ædipoda germanica* to be as widely distributed in the East as previous experience had made me acquainted with its occurrence in Switzerland, Italy, and Corsica, for I found it on the banks of the Pharpar on the 19th of April, where it took its short flights amid the corn; and again in the neighbourhood of Alexandretta, in the direction of Issus, on the 28th of the same month, as we toiled up among the myrtles, pomegranates, Portugal laurels, and styrax trees, beneath a very hot sun, to the ruins of the old castle of Merkes, two hundred yards from the shore; and lastly, I noticed it on the road leading to Marathon, on the 5th of June, as also previously at Belgrade, on the 28th of May.

Acridium tataricum, a locust with smoky brown wings, likewise a common species in Italy and Corsica, was also found near Alexandretta, on the road to Marathon, and at Beyrout as well.

Of *Mantis religiosa* I obtained a specimen off the orange trees in the Island of Roda, in March, and another clinging to a bough of *Ficus elasticus* was brought me at Beyrout in April.

There are also several grasshoppers that I collected in Palestine, Syria, Asia Minor, Turkey and Greece, chiefly in the last-named country, but which, if differing in kind, do not differ in their light brown or dust-coloured hue, as well as general appearance, from our common field grasshoppers at home. They are at present unnamed, as there is little use in taking Orthoptera

for comparison with those in the National Collection. What I take to be mole-crickets were found in the classic regions of the Pnyx.

I have two small specimens of the larva of a *Mantis* belonging possibly to the genus *Eremiaphila*, and bearing out its title in its natural habitat, as it was scarcely distinguishable in hue from the desert sand of Gebel Hashab, where I discovered it on the 22nd of March.

Lastly, the mention of a remarkable-looking insect, *Callimenus oniscus*, must not be omitted. It is a wingless locust that keeps up an incessant and shrill chirp, in the underwood of myrtle and cistus, &c., on either side of the roads to Laurium and Marathon. As it hushes its strain when approached, it is not always easy to detect its presence, more particularly as its ground colour is a bright apple-green, traversed by numerous horizontal bars of black across the body. This beautiful colouring, however, is turned to brown after its inevitable consignment to a wide-mouthed phial of spirits. It no doubt derives its specific name of ὄνικκος, "the little ass," in consequence of its similarity, from a dorsal point of view, to that beast of burden.

(To be continued.)

URTICATING PROPERTIES OF LEPIDOPTERA.

I HAD hoped that my note of inquiry on this subject (Entom. xvii. 256) would have elicited something more definite as to the cause of urtication than it has done. But at any rate the correspondence it has provoked has incontestibly proved one fact, *viz.*, that *Porthesia similis* and *P. chrysorrhæa* are capable of producing urticaria in all stages of their development. No doubt the same may be said with equal truth of other species which have hairy larvæ, and I think it is quite as certain that the poisonous property (whatever it is) can reach the face, &c., without the assistance of the hands.

In my former communication I purposely refrained from advancing any theory of my own, my purpose being rather to draw forth information from others who I hoped to find had studied the subject. I may now say that my opinion at the

time was—and still is—that the dust surrounding the cocoon, and which is wonderfully light, and set floating in the air by the slightest touch, is the medium by which the poison—for poison undoubtedly it is—is conveyed to the skin.

I find from an exhaustive and thoughtful paper in 'Psyche' (vol. iii., nos. 101 & 102), the organ of the Cambridge (Mass. U.S.A.) Entomological Club, which the editor, George Dimmock, Esq., has kindly sent me since my note appeared in the 'Entomologist,' that both American and Continental scientists appear to be ahead of us in this branch of Entomology.

Perhaps I may be excused, considering the paucity of information which we appear to possess on this subject, for making a few quotations from Mr. Dimmock's paper "On some glands which open externally on insects." Speaking of the larva of *Attacus cecropia* (and there is a strong presumption that what is true of one hairy larva is true, in a more or less degree, of others), he says:—"The red tubercles are seen, in sections cut with the microtome, to be divided into compartments, the cavities of each spine opening into a compartment at its basal end. The spines themselves are quite rigid and very brittle, so that they break away at a slight touch and leave a hole in the tubercle, out of which an odorous fluid pours, pushed by internal pressure. This fluid is strongly acid to litmus paper. The odour given out by these glands suggests at once their protective functions. . . . Glands similar to those of the larva of *Attacus cecropia*, in that they have no outlet until one is produced by external agency, are not rare in the larvæ of Bombycidæ. The severe poisoning produced by the hairs of certain larvæ of Bombycidæ, of which the so-called processionary caterpillar of Europe is an example, is caused by the secretion from a minute gland at the base of each hair. The secretion of these glands fills the hollow central portions of the hairs, and when the sharp, often barbed, hairs are broken in the flesh of attacking animals, the broken parts carry with them the poisonous secretion. This secretion is, perhaps, formic acid, or a formate in solution."

As Mr. South mentions *Cnethocampa* (Entom. xviii. 5) I give the following:—"Goossens regards the spines of the larvæ of *Cnethocampa* to be poisonous because of a powder produced by the drying of the secretion given out by the evaginable glands upon the dorsum of these larvæ. This view seems unacceptable

after Karsten, Keller and others have so clearly proved the presence of glands at the bases of the spines of these stinging larvæ."

And very much more, all tending to prove what Mr. South says he has only seen suggested by Mr. Swinton, *viz.*, that underneath the warts, on the hinder segments, glands are situated which secrete a poisonous fluid, which is forced in minute drops through the spines.

Coming to the insects we have lately had under consideration, Mr. Dimmock goes on to say, "The structure of the evaginable warts and their glands in *Leucoma silicis* will answer in a general way for the similar warts of *Orgyia* and of the European *Liparis*. The wart is protruded by pressure of the fluids within the body, and retracted by muscles; at or near its centre open the ducts of one or two glands which are situated beneath the warts. The position and general structure of these glands, as well as their motion when the larvæ are disturbed, indicate that they are defensive in function."

Just one more slight extract, which appears to throw a little light upon the mode in which the imago causes urtication:—"Still another form of gland is that at the anterior end of certain *bombycid* pupæ, which breaks when the imago springs the chitinous pupal skin, and leaves its secretion, which has been termed bombycic acid, on the head of the moth."

I trust these few extracts will give a fresh impetus to the investigations of those gentlemen who have the time and means of successfully following up this inquiry.

GEORGE BALDING.

Ruby Street, Wisbech, January, 1884.

THROUGH the courtesy of Mr. Geo. Dimmock I have been favoured with a copy of the American publication 'Psyche,' vol. iii, No. 101, 102, containing a valuable and interesting paper by that gentleman—one of the editors—"on some glands which open externally on insects," in which are some observations showing that the urticating properties of certain lepidopterous larvæ are due to the glandular hairs, somewhat of the nature of those of the stinging-nettle.

For every effect there is a cause, and the irritation produced by some caterpillars is a fact which cannot be gainsaid. It

therefore would be time profitably employed by any lepidopterist in investigating the subject. Experience proves that it is not all hairy larvæ which possess this painful property; nay, that it is confined to comparatively few of them. Why is this? It seems rather humiliating to entomologists of our own country that, with almost one exception (that of Mr. Swinton), no researches have been made which show any light upon what has too long remained a "quæstio vexata," and that to learn anything respecting urtication we must go to our friends in America, or it may be here and there a Continental authority. Mr. Dimmock has evidently bestowed much labour upon the subject himself, and has sought for information from every available source. To show what has been done in America the following short quotations may be serviceable to many of the readers of the 'Entomologist':—

"Karsten, in 1848, described the anatomy of the poison-glands at the base of the hairs of an American species of *Saturnia*. Five illustrations of this kind of gland are to be found in the stinging hairs of the larvæ of *Hyperchiria io* and *Hemileuca maia*, both common insects in parts of the United States. Lintner and Riley have recorded their experiments in the stinging power of these two species of larvæ, and the latter writer has given a list of the larvæ of American species of Lepidoptera which are known to sting. Lintner has experimented further upon the stinging power of the larvæ of *Lagoa crispata*, and Miss Murtfeldt upon that of the larvæ of *Lagoa opercularis*. That the sting of some of these larvæ can do lasting injury is certain, for my mother, when twenty-seven years old, received so severe a sting in the middle finger of one hand in brushing away a larva from her neck, that the distal joint, healing only after several months, remains somewhat stiffened and slightly deformed, now thirty-seven years. For a time the stinging of these bombycid larvæ was attributed to the action of the hairs in entering and wandering about in the flesh; and even as late as 1881, long after the discovery of the glands at the base of the hairs, Goossens advances the idea that the poison of the processionary caterpillar of Europe comes from other glands. Keller, in 1883, discusses the mode of urtication in the processionary caterpillar (larvæ of *Gastropacha*), and figures the glands at the bases of the thin hairs."

Surely some British Entomologist is capable of verifying these statements, and bringing the question to a definite conclusion.

JOSEPH ANDERSON, JUN.

Chichester, January 8th, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

SCIENTIFIC NOMENCLATURE AND DR. LANG'S EUROPEAN BUTTERFLIES.—The recent criticisms on the 'Entomologist' Synonymic List of British Lepidoptera, as well as the review of Dr. Lang's beautifully illustrated work on the European Rhopalocera (Entom. xvii. 284), induces me to ask information on a few points of nomenclature, &c. I observe that in Mr. South's List *Epinephile hyperanthus* has become *E. hyperanthes*; and *Argynnis lathonia*, *A. latona*. Now, for my own part, in opposition to the criticism in a contemporary, I quite concur in the propriety of altering a mis-spelt name, when it is clear that the error was a sin of ignorance or carelessness on the part of the godfather; but there is, nevertheless, such a thing as being philologically hypercritical, which I am inclined to think the first change is. Now *hyperanthus* may not be correct as a Greek derivation, for I presume this is what is meant by the suggested emendation; but perhaps the author merely Latinized *ὑπερ ανθεος*, in which case the termination might stand. With the second correction, however, I quite coincide, as being certain to be eventually adopted, as there can be little doubt that the beautiful goddess stood gossip to this shining insect, although I am puzzled by Dr. Staudinger's "recte Latonia." In Dr. Lang's 'Rhopalocera Europæ' there are various departures from the recognised orthography, and, as he has deviated very rarely from Dr. Staudinger's nomenclature, it would be interesting to know the grounds of these departures. On p. 103 a var. of *Lycæna ægon* is given as "*argryrotoux*," Berg.; and on p. 105 is *L. argus* ab. "*argyronomon*," Berg. Is not the adjectival prefix the same in both names, seeing that both were given by the same author? And if *αργυρος* be not, what is the adjective intended? The latter name is spelt by most authorities, "*argyrognomon*." Is there any indication whether *γνῶμον*, the index of a sundial, or *νομος*,

a shepherd, was meant by Bergsträsser? On p. 245 a var. of *Erebia æme*, "*psodea*," Frr., is given, while Staudinger substitutes *spodea*, there being already a *psodea*, Hb., var. of *E. medusa*. Surely this is not only admissible but advantageous? On p. 208, *Argynnis elisa*, Godt., is given as "*eliza*." On what grounds? On p. 312, *C. typhon* var. *rothliebi* becomes "*rothliebii*"; and, at p. 233, the var. *herta*, Hb., of *Melanargia larissa*, "*hertha*." At p. 354, ab. *catena*, Stgr., is given as "*catæna*"; and *nostradamus*, F., as "*nostradamus*," the latter being, if my memory serves me, the correct spelling. At p. 290, *mæra* becomes "*mœra*"—on what proof? and *thanaos*, Bdv., "*thaunaos*." Not having access to the works of the earlier entomological authors, I am unable to seek out the data upon which Dr. Lang relies. There are also scattered throughout the work various misprints not included in the errata, which, for the benefit of those who possess the volume, I will indicate under correction:—P. 125, "*Menacclas*" (*Menalcas*); p. 147, "*Trappe*" (Trapp); p. 155, "*Heyères*" (Hyères); p. 202, "*freijsa*, Thub." (Thnb.). Query, would it not be better to print this name *freiia* in an English work, as is done in *Deione* for *Dejone*, *Aglaia* for *Aglaja*, *Iolas* for *Jolas*, &c.? P. 245, "*Puy de Saucy*" (Sancy); p. 262, "*livonica*" (*livonia*); and on Pl. LXIII. is "*var. pithio*, Hb." (*pitho*, Hb.). I notice, too, that Dr. Lang denies the occurrence of *C. edusa* and *E. epiphron* v. *cassiope* in Ireland. The rarity of Dr. Birchall's List no doubt accounts for these mis-statements; but I should be interested to know whether *Cistus* is correctly given as the food-plant of *C. myrmidone*. In conclusion, perhaps I may be allowed to bear my testimony to the admirable style in which the illustrations have been brought out, their accuracy of tint—even in the *Lycænidæ* and other genera difficult to produce satisfactory facsimiles of—exceeding, in my opinion, any that have hitherto appeared in previous works on European Entomology. In the *Hesperiidæ* only I think some characteristic markings have in some instances been omitted; and no wonder, for some of this family remain a puzzle to the best Lepidopterologists.—W. F. DE V. KANE; Dec., 1884.

SCIENTIFIC NOMENCLATURE.—Now that Mr. South has published his new synonymic list of all Lepidoptera which have hitherto been taken in this country, it is a good opportunity to protest against the habit of naming new species after individuals, which some entomologists have adopted. To take, as an example,

the new *Eupithecia* described in your columns last October; Mr. C. S. Gregson (who, by the way, says in his recent book on the subject that "anything will do for a name") has called it *Eupithecia curzoni*. This is not good Latin, and should, of course, have been *curzonensis*; yet, according to the "inexorable law of priority," or at least according to Dr. Staudinger's canon (referred to by Mr. South in his preface), the species must remain *E curzoni* till the end of time, in spite of the fact that the Latin is bad, and the name about as meaningless as a name can possibly be. This is the weakness of the law of priority. A bad name once given can never be changed for a good one. Confusion is thereby certainly avoided, yet it is very doubtful whether science is bettered. But why did Mr. Gregson call the species *curzoni* at all? He gives us his reason; he named it in honour of his friend Mr. Roper-Curzon, from whom he received a most liberal supply of perfect insects and larvæ. All honour where honour is due certainly, but it is, all the same, a very bad principle of naming to call a species after an individual. If such a principle were generally adopted, then anything would do for a name so long as it had a Latin termination. Is the name to have any meaning? If not, a system of giving a number or letter to each species, such as is in vogue with astronomers for denoting particular stars, would be the simplest, shortest, and most methodical. But if the specific name is to have any meaning at all, it ought to have as much meaning as possible. Now when an insect is named after an individual, *e. g.*, *Pieris spilleri*, recently described in the 'Entomologist,' we learn nothing about it from its name beyond the mere fact that a certain collector some time or other had the good luck to be the first to capture it. Perhaps to infer even so much as that from the name would be wrong, *e. g.*, when one entomologist, describing a species, gives it a name in honour of a friend. A name should, if possible, serve as a description, as it does roughly in the cases of *Vanessa c-album*, *Smerinthus ocellatus*, *Macroglossa bombyliiformis*, *Plusia gamma*, &c. It may be difficult nowadays to find a descriptive epithet for a new species which is not already in use; but this should, whenever possible, be our principle in nomenclature. Failing this, the insects can be called after a marked or peculiar habit, *e. g.*, *Odonestis potatoria*, or after the usual food-plant, as has been done

in the case of *Thecla pruni*, *T. quercus*, *T. rubi*, *Sphinx convolvuli*, *ligustri*, &c.; or, again, where the insect's range is not wide, after the particular locality in which it is found. But it should only be our very last resource to call a species after an individual. It is true that in what may be described as pre-scientific days names were given which were drawn from ancient mythology, e.g., *Argynnis selene*, *A. latona*, *Lycæna dævus*, *L. corydon*, *L. arion*, &c.; but such names, though apparently meaningless, have, to my ear, at any rate, a classical ring about them which makes them acceptable, but which such names as *E. curzoni* or *P. spilleri* altogether lack. Would it not be best, if the discoverer of a new species were denied the absolute right to give the name, but might only suggest it, and the name to be adopted by English entomologists be definitely fixed by some authoritative scientific association, which would take care that improper names were never recognised? Probably the London Society, or the editorial staff of the 'Entomologist,' would be the proper body to regulate all new cases of nomenclature.—A. CHITTY; Balliol College, Oxford, and 33, Queen's-Gate Gardens, S.W., December, 1884.

EXCHANGING.—The Rev. Gilbert H. Raynor, speaking of marked lists, advocates placing a mark against our desiderata, leaving blank those species we do not require. Assuming, for the sake of argument, that the British species number 2000, if we adopt the plan of marking off those we are not wanting, by the time our collection is complete, clearly we shall have made 2000 marks. Let us now look at the other side. The Reverend gentleman takes an extreme case when the desiderata are but 2 per cent. I will take the other extreme, and suppose an entomologist possessing full series of 1001 species commences to exchange. To complete his list he will have made 999 marks, and 999 erasures or other marks, a proceeding which would at least be no more speedy than the making of 2000 marks, to say nothing of the appearance of the list. After all, in preparing a list for exchange, it is not the mechanical act of marking which takes the time, but the consideration required to mark off the right species, and I have always found the pen to keep pace with the mind in this matter. Some people use a list with the species numbered consecutively, such as Staudinger's; one's duplicates or desiderata are then quoted

by number, an arrangement which answers well enough in certain cases. There is still, however, room for improvement, and anyone who can introduce a plan curtailing the immense labour involved in conducting an active correspondence and exchange will deserve well of his brethren. We must all agree with Mr. Raynor in his remarks upon the great value of time. To the student, the true worker, time is more than money or anything else besides, and it is from a deep conviction of this important truth that I am unable to subscribe to the following sentiment:—"In the good old days, when 'exchanging' specimens first began, it was comparatively common to see a notice from some prominent collector, offering certain species to be given away to those who would send box and return postage. How rare is such a display of generosity now-a-days!" Quite so! perhaps we are wiser in our generation. The advocates of such promiscuous generosity should give it a full trial. I apprehend there would be little difficulty in disposing of a few "*Apatura iris*," or any other good thing on those terms. But who is to benefit by the transaction?—to receive the product of our most precious time? Not our old and valued correspondents, but "beginners and outsiders," we are told. Surely beginners want no encouragement. For them all is novelty and excitement. If they are made of the right stuff they will come to the front in spite of difficulties and disappointments; if they are not, no encouragement will raise them above respectable mediocrity, and of these we always have enough. For "outsiders" and dabblers I entertain the heartiest contempt. Their knowledge of our science is of the most superficial and elementary character, for which, in itself, they are not to be condemned, but they make no advance; they have attained maturity. Year after year they pursue the same attractive species, which are often hunted to death. *Eupithecia* is neglected; *Crambus* ignored, and *Scoparia* unknown. What care they for the wonders of *Bucculatrix*, the beauties of *Nepticula*, or the marvels of adaptation exhibited by the endless *Coleophoræ*? Is not *Dominula* still to be had? And what a fine picture it makes with the "marbled white" for a border! Of these people we have more than enough. Let them go their way. I will not encourage them; but the tried correspondent—the genuine naturalist—is welcome to all I have.—

GEO. COVERDALE; 24, Fleming Road, Lorrimore Square, S.E.

EXCHANGING.—Until recently my own exchange list was embellished with the prevailing marks against complete series; but one of my correspondents favouring me with his marked list, I was much struck with his method, and at once adopted it. As I think it could hardly be improved upon, I venture to give particulars. Complete series are left unmarked, incomplete have a cross, and a stroke is put against species unrepresented in the collection, which stroke is crossed when a specimen or specimens are obtained, and when a series is completed the cross is surrounded by a circle. The list thus stands: *Complete*, no mark or *. *Incomplete* +. *None* —. This is a very simple arrangement, and, I think, would meet the approval of your correspondents. With reference to the concluding portion of Mr. Raynor's paragraph (Entom. xviii. 23), I think the secret lies in the fact of the very large increase in the number of collectors. At the same time I feel sure there are yet many who would feel pleasure in assisting others in the manner described. Will your correspondent lead the way?—E. SABINE, 17, The Villas, Erith.

TIME OF APPEARANCE OF ARGYNNIS PANDORA.—In the last number of the 'Entomologist' (p. 21) a correspondent refers to the time of appearance of *Argynnis pandora*. Most authors give June and July as the period when this species appears in the imaginal state. Some, however, as Herrich-Schaffer, only mention June. An example from the collection of the late Sir Sidney Saunders is ticketed "Yanina, June." I believe that I have given correctly its normal times of appearance in my work as referred to by Mr. Carrington. But it must be recollected that the evolution of the imagines in this genus is hastened or retarded by the forwardness or lateness of the season. For instance, the normal time of appearance of *A. adippe* in this district is about the middle of July; yet in forward seasons it will occasionally appear nearly a month earlier; on the other hand, it is sometimes the end of July before it makes its appearance, fresh specimens being obtainable till the middle of August. Almost the same may be said of *Argynnis paphia*. Again, altitude has a very marked effect. I have taken *A. adippe* and *A. aglaia* in a perfectly fresh condition at the beginning of September in rather elevated localities in Switzerland, whereas in the lower-lying places they would by that time have ceased to appear on the wing for a month. I think it is

most probable, though I have never taken the species, that *Argynnis pandora* is influenced, in a manner similar to that seen in its immediate congeners of the Palæarctic fauna, by temperature and elevation.—HENRY C. LANG; Maidenhead, Berks, January 26, 1885.

SOARING HABIT OF *VANESSA ATALANTA*.—Whilst coaching from Bettws-y-coed to Capel Curig, N. Wales, in September last, I observed large numbers of this species, which was very common generally, rise from the branches of ashes and oaks as we passed. Every few yards two or three of the insects were disturbed, and soared to a considerable height, like *Apatura iris*, the resemblance to whose flight was strikingly similar, a fact I had never previously noted or seen recorded.—MARTIN J. HARDING; Old Bank, Shrewsbury, December 21, 1884.

ABUNDANCE OF *VANESSA ATALANTA* AND *V. CARDUI*.—With regard to Miss Hinchcliff's note (Entom. xvii. 271) on these species, I may say that both have been particularly numerous in North Kent through the summer of 1884, a circumstance more noteworthy, because it has not, on the whole, been at all a good season for butterflies. Several of the usually abundant species have been excessively scarce; one of the oddest disappearances, not merely in 1884, but for several years past, is that of *Vanessa io*, which was so familiar to us amid the cliffs and chalk-pits, delighting in the bloom of thistles and brambles.—J. R. S. CLIFFORD; Cambrian Grove, Gravesend, December 11, 1884.

LEPIDOPTERA IN SOMERSETSHIRE.—It has again been a barren year for collectors in this part of the West of England. *Vanessa cardui* and *V. atalanta* were exceptionally common, almost every other species of Lepidoptera especially rare. At sugar, although I persevered until late in October, only one species appeared in any numbers; my old acquaintance *Polia flavicincta*, even *Anchocelis pistacina*, *Triphæna pronuba*, *Phlogophora meticulosa*, and such-like common insects appeared but sparsely. Of course *Xylina semibrunnea* and *X. socia (petrificata)* were looked for in vain.—H. W. LIVETT; Wells, Somerset, December, 1884.

EUPITHECIA LINARIATA AND ACIDALIA VIRGULARIA DOUBLE-BROODED.—The past season, owing to its intense heat, was undoubtedly favourable to the development of second broods of insects which generally appear but once in the year. Yet how

very partial this second appearance must have been is shown by the fact that, although something like a hundred pupæ of *E. linariata* resulted from larvæ I took at Hazeleigh, in September last, only one of these produced an imago. When this emerged I cannot exactly say, as I only found it to-day. It would, no doubt, be before the middle of November, when the cold weather set in. I think the fact worth recording, as the pupæ were left in a room where there has been no fire, and my experience with the species is that even when the pupæ are kept in a warm place they never emerge before their natural time of appearance, in June. Some Eupitheciæ may easily be forced, as, for instance, *E. albipunctata*, which, when subjected to a warmer temperature than usual, emerges regularly in February and March. With regard to *Acidalia virgularia (incanata)*, I took a single specimen at light, at Brentwood, towards the end of October. Many of the Acidaliæ are partially double-brooded when reared in captivity, but I think this is rarely the case with them in a state of nature.—(REV.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, December 26, 1884.

EUPITHECIA CURZONI.—In vol. xvii. of the 'Entomologist' (p. 230) is a description of this species, which is fully and carefully described throughout the various stages of its life-history, together with some remarks thereon, one remark being that this is probably the insect figured in the 'Entomologist' (vol. xiv. plate 1, figs. 2 and 3, &c.). If, after reading this description and these remarks, and seeing these figures, anyone can "have a strong opinion" that this species "is nothing more or less than a variety of *E. nanata*" (see Entom. xvii. 277), I need only say that it does not follow because he is blind to specific differences that other people cannot see them. As to the writer having sent his specimens of this species "to our most eminent entomologists, who all agreed with him in considering it to be a very interesting form of *E. nanata*," I have nothing to say, but that if our most eminent entomologists merely agree with him in "his strong opinion," but know nothing of the fact that it is a distinct good species, then I may perhaps be allowed to say that I do not esteem very highly the mere opinions of naturalists, however eminent they may be thought to be, if their opinions do not agree with the natural-history facts known to me. In reply to line 17 (Entom. xvii. 277), I may say

I usually base my conclusions upon my own observations, or upon the observations and conclusions of other careful observers, and not upon mere opinions. The interesting footnote on the page just referred to has but one fault—it is too short. Will the Editor of the 'Entomologist' give us a translation of August Hoffman's paper on the Lepidoptera of the Shetland Isles in an early 'Entomologist'? I am sure everybody would be delighted. It is hardly fair that your readers should be left in doubt by A. Hoffman, Dr. Staudinger, and E. A. Fitch, all first-rate entomologists, yet are to be bound by the mere opinion of an insect collector who evidently does not know the larva of the common species *Eupithecia nanata*, which is a long, cylindrical (tapering to the head), often day-feeding larva, with dorsal lozenges all along its back, and which cuts a round hole into the flowers of *Calluna vulgaris* to get at the stamens; from an appressed (tapering to head and anus from the central segments) wrinkled larva which feeds at night on the lower branches, eating the leaves and caring little for the flowers of the same plant. I need scarcely call attention to the trivial name of *E. nanata*, "the narrow-winged pug;" anyone looking at figs. 2 and 3 of the plate will see that the draughtsman realized that *E. curzoni* is not a narrow-winged pug, but exactly the shape of *Eupithecia satyrata*. When looking over Mr. Curzon's captures here, he again called my attention, as he had before done by letter, to the fact that hardly two of his long series of *E. curzoni* were alike, and that very often the two upper wings differed in pattern—see the figures named above, where the artist has carefully hit this peculiarity off. Now for *E. nanata*, I do not know a more constant pug. I have only seen three varieties of it; they are all in my cabinet, but only one of them is a striking variety; yet I have bred and looked carefully over many thousands of bred and captured specimens for varieties. *Nanata* larvæ can be swept off heather flowers in profusion during afternoons. Mr. Curzon swept for *curzoni* larvæ at Unst day and night, but never obtained one by that process.—C. S. GREGSON; Rose Bank, Fletcher Grove, Liverpool, December 17, 1884.

NOTE ON THE LARVA OF *STILBIA ANOMALA*.—Although Dr. W. S. Riding obtained his eggs of *Stilbia anomala* from several moths (Entom. xviii. 1), it is evident he only succeeded in rearing

one variety of the larva from them. There is another very distinct form, having the ground colour bright pea-green. Descriptions of both may be found in the Ent. Mo. Mag. for February, 1880, p. 210.—GEO. T. PORRITT; Huddersfield, January 3, 1885.

LUPERINA GUENEEI AND L. DUMERILII.—I see *L. gueneei* is omitted in Mr. South's list; at least I cannot find it; and we must not have this very distinct species blotted out without showing why. Now here is my proof towards its continuance. In 1860 or 1861 T. Porter (still living) brought me two fine specimens of a moth I did not know. They were of both sexes. I purchased them from him, and sent them on to the Rev. H. Burney, who forwarded them to Henry Doubleday. From him they went to Guenée, and he returned them with the remark that he had a specimen in his collection marked as a variety of *L. testacea*, but he was quite satisfied they represented a good species when he saw both sexes. H. Doubleday then named them after Guenée, as the latter was evidently the original captor. I saw Porter again, and he told me another man, by name H. Stephenson, had one. They took three in all near the ferry at Rhyl, N. Wales. I sent Porter again, and went myself, but we failed to find more afterwards. I bought the specimen from Stephenson, and sent it on to Miss Sullivan, of Fulham, where, I suppose, it remains. I think it was a female. Now could a better tale be told? By the way, how many *L. dumerilii* have ever been taken in this country, and where are they, and who were the captors? I think while there are some of the old collectors and entomologists left these things should be brought to the front. Will anyone who has got *L. dumerilii* publish the fact and particulars of its capture?—J. B. HODGKINSON; 15, Spring Bank, Preston, December 15, 1884.

MYELOIS CERATONIAE AT GREENWICH.—It may be interesting to some of the readers of the 'Entomologist' to know that I took a fine specimen of *Myelois ceratoniae* in my house on the morning of December 1st. This is the third specimen I have found in the same room, at different times. The first two were taken in the month of July—one this year (1884), the other in 1880. I believe the insects I have found came from larvæ feeding in almonds. I found some larvæ feeding in almonds some time ago, and, laying them by, I thought no more of them. At any rate,

this is the only way I can explain their appearance in such a strange locality. I suppose the late date is not at all remarkable for species bred under the circumstances; the temperature of the house would be sufficient to account for it.—J. TUTT; Beaconsfield Terrace, Greenwich, S.E., December, 1884.

NOTES ON COLEOPHORÆ.—In October last I found a few cases of a *Coleophora* which agree tolerably well with the description of the case of *C. vibicigerella* which I have had sent me. They are now hybernating, and I hope to give you a good account of them later on. While collecting the cases of *C. artemisiella*, which have been unusually plentiful this autumn on *Artemisia maritima*, I found nine cases of a *Coleophora* which I do not recognize. They are rather paler, but otherwise very similar to the case of *C. paripennella*, an insect one would hardly expect to meet with on a saltern where there are no bushes, and where the plants are occasionally covered with the tide. Whether these are now full grown or merely hybernating to again feed in the spring, time must decide. I hope some of them may reach the perfect state.—WM. MACHIN; 29, Carlton Road, Carlton Square, E., December 22, 1884.

NAPHTHALINE.—In reply to inquiries made by me in November, 1883, to Mr. Erastus Corning, of New York City, he very kindly sent me over a box of lump naphthaline, asking that I should give it a fair trial, as he had only found one collector advising the use of it instead of camphor. I had used naphthaline as sold by English chemists for some years past, and at once placed some of it in a separate box of insects, selecting those most prone to grease. After a year's trial I find the insects are entirely free from grease and mites. Mr. Corning told me he had found it useless for destroying insect "pests" already in existence; of this I am unable to speak from personal experience, not having had any to experiment upon. The lump naphthaline has been in great request among my entomological friends. I am pleased with it, and would certainly advocate its use, much preferring it to camphor.—R. M. SOTHEY; Eastbourne, December 4, 1884.

[Naphthaline has for some time past come into general use amongst entomologists, for the preservation of dried insects. The lump naphthaline, such as described by Miss Sothey, can be obtained at the shops of those gasfitters who supply the

albo-carbon light fittings, or direct from the Albo-Carbon Light Company, Horseferry Road, London, S.W.—ED.]

LEPIDOPTERA NEAR BROMLEY.—On page 20 there is rather an unfortunate omission: on line 4 from bottom, after "*Leucania lithargyria*," insert "*Pseudoterpna cytisaria*;" the remark "two—one green and one brown," refers, of course, to the *Pseudoterpna*, and not to the *Leucania*.—T. D. A. COCKERELL; January 9, 1885.

OBITUARY.

SIDNEY SMITH, of Walmer, was sufficiently well known as an entomologist to merit an obituary notice. As a scientific collector, an ardent lover of Nature, and indefatigable worker even in his 78th year, few can have exceeded him. A good botanist was he too, whilst his genial happy nature made him a welcome companion. For years he maintained broods of the honeycomb moths, which by his means were broad scattered through the country, and he was one of the first to capture in England *Margarodes unionalis* and *Eugonia autumnaria*. He was particularly lucky in finding varieties of Lepidoptera. No later than in 1884 a trip to St. Margarets yielded him one imago each of *Callimorpha dominula*, with pink and yellow hind wings. Of the latter form he had several, and more than one black one fell to his net. To show his vigour and desire never to be left behind in the sports of his country, it may be mentioned that last summer, although getting very stiff in his limbs, he often joined in a game of lawn tennis. To the hot weather of August may be attributed the illness which ultimately caused his death, for becoming very heated through a walk on the sand-hills, he sat down and took a chill which resulted in pneumonia and bronchitis. He died at Walmer, where he had long resided, on the 28th December last, aged nearly 80 years. Any information which he could impart to other entomologists he was glad to afford, and few London collectors ever left his part of the country without calling upon him. As a conchologist he was not to be despised, and he was known as the discoverer of the true var. *picta* of the common limpet, the form that previously had the credit of being that variety being found to be incorrectly named.

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MIMICRY IN INSECTS.

BY ROLAND TRIMEN, F.R.S., &c.

(Concluded from p. 30).

I HAVE given various of the more noteworthy instances of protective resemblance to (first) the prevalent general colour of the surroundings; and (secondly) the colour, form, &c., of particular objects, mineral and vegetable. There remains for brief consideration a third and most interesting group of these resemblances, *viz.*, the cases in which other animals are imitated.

It is to this class of imitations that the term "mimicry" was first applied by Mr. H. W. Bates; and, although the word has the defect of implying in ordinary usage *conscious* or *voluntary* imitation, it has been generally adopted, in default of any better one, to express the actually deceptive likeness of one animal to another, which in all essentials of structure is quite different.

These mimics necessarily are of a more limited and special kind than those already treated of, seeing that the only animals to imitate which would be of advantage to others are such as can successfully resist their enemies, or are for some other cause exempt from persecution to a large extent, or can serve as prey if approached under cover of a likeness to themselves. If an unarmed creature can wear the aspect of one widely dreaded for its weapons of offence, or a soft and defenceless animal look as if it were encased in the armour of proof borne by some well-protected neighbour, or some toothsome and eatable being bear to deception the likeness of a malodorous, distasteful, uneatable

one,—it is plain how useful the disguise would prove. And this is exactly what takes place in Nature,—disguise is resorted to by those who lack the armour, or the weapons, or the uneatableness of the more favoured kinds.

But few cases of actual “mimicry” in this restricted sense have been recorded among the vertebrate animals, Mr. Wallace citing only a few cases where harmless snakes (in Tropical America) copy in a very striking manner certain venomous kinds, and a group of orioles (in the Malayan Archipelago) unmistakably imitate the strong and active honey-suckers of the genus *Tropidorrhynchus*. But amongst insects the number of such cases is very large, and the record of them is constantly increasing, as the life-history and habits of the lower animals are more closely observed.

Taking first the case of the mimicking of well-armed by unarmed insects, we find that bees and wasps have excellent imitators in the shape of many moths and two-winged flies, of some beetles, and of a few crickets; and that ants have also beetle mimickers. The transparent-winged moths of the groups represented by the genera *Sesia*, *Ægeria*, &c., and many species of Glaucopteridæ, imitate so precisely the aspect of various stinging Hymenoptera that no one but an entomologist could distinguish them as Lepidoptera. One of these *Ægeriid* moths, *Melittia ursipes*, is not uncommon in Natal; its general aspect and colouring, and densely hairy hind legs, make it exactly like a small bee. Most people must have noticed the drone-flies (*Eristalis*) which haunt flowers, and not only look like bees, but get up a very fair imitation of an angry buzz, and even affect to possess a sting, when you hold them captive, by curving round the hind body. South Africa abounds in beautiful bee-like flies of the *Bombylius* type; and it is probable that, as has been shown in Europe and elsewhere, the disguise of these flies (which are in many cases parasitic as larvæ upon bees) enables them to enter, unsuspected and unharmed, the bees' nests, and there to lay their eggs. The beetles that find their advantage in resembling bees and wasps are chiefly members of the great wood-eating tribe of Longicorns, and in several cases their elytra are so much reduced as to leave nearly all of the folded wing-surface visible, an arrangement which greatly aids in the deception. Mr. Bates has recorded the wonderful resemblance

which the crickets of the genus *Scaphura* in South America bear to different large sand-wasps, which are constantly searching for crickets to provision their nests with!

A very remarkable case of the mimicry of a predaceous beetle by a cricket (in the Philippine Islands) is given by Professor Westwood, in which the resemblance is so exact that even that most experienced entomologist was deceived, and placed the cricket among the specimens of the tiger-beetle in question in his collection!

It is among the weevils or "snout-beetles" (Curculionidæ), and the allied Anthribidæ, that the best instances of defensive armour occur, many of these insects having such exceedingly hard integuments that no pin will pierce them. Mr. Bates records two, and Mr. Wallace five, cases in which beetles of the Longicorn group closely copy Curculionidæ inhabiting the same districts; and in one of these Mr. Bates found the hard weevil and the mimicking Long-horn on the same tree.

Turning now to those cases where it is to the interest of defenceless forms which are palatable to their enemies to resemble creatures that are habitually rejected or passed by as uneatable owing to their offensive odour or taste, we find some of the most prominent and perfect mimicries known. The phenomenon is most complete and conspicuous among butterflies; and it is to the distinguished traveller and naturalist, Mr. Henry Walter Bates, F.R.S., that Science owes the first and only rational exposition and explanation of the subject that has been given. His memoir, read to the Linnean Society of London, in 1861, and subsequently published in the 'Transactions' (vol. xxiii.) of that body, was entitled "Contributions to an Insect Fauna of the Amazon Valley. Lepidoptera: Heliconidæ;" and in it he lucidly presented the results of many years' daily experience and observation of the variation, habits, distribution, and relative numbers of the brilliant slow-flying species free from persecution, and of the accompanying imitative forms of different groups. Mr. Bates showed that, while the models were most abundant and presented the ordinary facies of their family, the mimickers were rare, and departed very widely from the appearance of their nearest allies; that the latter frequented the same spots as their models, often flying among them; and that the resemblance in Nature was so exact that his own well-practised

sight did not prevent his being constantly deceived by it when out collecting. He observed that the conspicuous and slow-flying Heliconidæ were not pursued by any of the ordinary enemies of insects to which they would have fallen easy prey, and suggested the reason for this security in the peculiar smell which they emitted. Demonstrating the identity in kind of these most striking mimics with the protective resemblances to vegetable and inorganic forms so widely prevalent in Nature, he traced them all to the operation of "natural selection," the agents being none other than "insectivorous animals," which gradually destroy all the individuals of mimicking species least resembling those which are exempt from persecution.

Mr. Bates gives a list of no fewer than thirty-six cases of mimicry known to occur among the butterflies and moths of Tropical America. In one of these six species (three butterflies belonging to two families, and three moths belonging to two families) imitate one and the same Heliconide species, viz., *Methona psidii*; and in another, four butterflies (of three different families) and a moth all copy *Ithomia flora*. The imitations of species of *Ithomia*, *Mechanitis*, and *Methona*, Heliconide genera, by species of *Leptalis*, a genus of Pierinæ, or "white" butterflies, are so surprisingly perfect that nobody who has seen the insects concerned, or even the figures of them illustrating Mr. Bates's paper, can wonder at their deceiving on the wing the most experienced collector.

The view propounded by Mr. Bates received most weighty confirmation at the hands of Mr. A. R. Wallace, who, in his interesting paper on the Papilionidæ of the Malayan Region (read to the Linnean Society in 1864), called attention to the occurrence of a quite similar series of mimics in India and the Eastern Archipelago, and unreservedly expressed his entire concurrence in the explanation given of the causes at work in the production of them. Mr. Wallace pointed out that, as in America, so in the Old World, it is butterflies of the Danaid group that are most often the objects of imitation by those of other families, and gave a list of fifteen of the best-marked cases known among the Papilionidæ alone. The first of these may be noted as peculiarly interesting, seeing that the male and female of the mimickers, *Papilio paradoxa*, differ considerably, and that each mimics the corresponding sex of *Euplœa midamus*. In

seven of the fifteen cases given only the female is mimetic, and Mr. Wallace suggested that the reason of this is probably that the slower flight of that sex when laden with eggs, and her exposure to attack while ovipositing, render it especially necessary to have a protecting disguise.

It was my good fortune to be able to supplement the cases brought forward by these distinguished explorers of South America and the Malayan Archipelago by a similar series of mimetic analogies among African butterflies. From the beginning of my collecting in South Africa I had been familiar with one or two striking instances of mimicry, and a visit to Natal in 1867 made me acquainted with several others. While in England shortly afterwards I had excellent opportunities of working up the subject, and early in 1868 I read to the Linnean Society a paper (subsequently published in the twenty-sixth volume of its 'Transactions'), describing in detail the eleven cases of mimicry then known to me. It was interesting to be in a position to fortify the conclusions of Messrs. Bates and Wallace by personal observations made in an entirely different region. I showed how the *Danainæ* and *Acræinæ* of Africa, like their allies elsewhere, were provided with offensive odours and secretions, and that several of them were accompanied throughout their geographical range by faithful imitators belonging to quite distinct groups. It was further pointed out (1) that the mimicking butterflies invariably occurred in districts inhabited by the species mimicked, and in six cases (South African) are found in the very same localities; (2) that in eight cases the mimickers are known to be very much scarcer than the species which they copy; (3) that in five cases, where the *Danaï*s or *Acræa* presents local forms, or merely slight varieties, even these are mimicked by individuals of the imitating species; (4) that in three cases, where the sexes of the insect mimicked differ remarkably from each other, the sexes of the mimicker present corresponding differences; and (5) that, in four cases observed by me in Nature, it was next to impossible to distinguish the living mimicker from the species which it imitated. It must be remembered that these extraordinary likenesses are not those of general colouring and pattern alone, but include outline and form, extending to minute reproduction of prominent markings however small; and that the deception is often further borne out by following closely the kind of flight and mode of resting exhibited by the species copied.

Probably *Amauris echeria*, a Danaide of wide occurrence in wooded localities, is the best-protected butterfly in South Africa, judging from the number of imitators to whom it seems to set the fashion. The most accurate copyist is the female *Papilio cenea* (type), but the female *P. echerioides* is almost as good; while the males of these species of *Papilio* are utterly dissimilar both from their respective mates and from each other. Both sexes of *P. brasidas* present individuals which fairly imitate *Echeria*; while among the Nymphaliniæ an almost exact reproduction occurs in both sexes of *Euralia mima*, and an approximate one in the female of *Pseudacræa tarquinia*.

As the case of *Papilio cenea* presents perhaps the most remarkable mimetic analogy yet recorded among butterflies, and as it has been worked out in South Africa, and is now widely known and quoted, it may be of interest to offer a few remarks upon it. The male of this species is a very fine conspicuous insect, with a peculiar colouring of very pale creamy yellow, with a broad black border to the fore wings, and a black band across the disk of the hind wings, the latter wings bearing each a long broad process or "tail." It is the southern representative of the West African *Papilio merope*, and was formerly known under that name. Five-and-twenty years ago nobody thought of associating with this beautiful butterfly the altogether different *Papilio cenea*, which is black, with ochre-yellow patches and spots, and has no tails on the hind wings, and, as mentioned above, is so close a mimicker of *Amauris echeria*. Yet these strikingly dissimilar insects, when closely examined, exhibited so many points in common, that finding only males of one pattern and only females of the other, and knowing that the two haunted the same woods, and that the conspicuous *P. merope* had been seen in pursuit of the sombre-tinted *P. cenea*, I was fully persuaded by the year 1867 that the two were sexes of one and the same kind. More than this, I felt next to certain that two other female *Papilios*, *P. trophonius* and *P. hippéoon*, var., one of which mimics *Danaïs chrysippus* and the other *Amauris dominicanus*, were also females of the same pale yellow tailed male. In the paper dealing with mimetic analogies, which I have already mentioned, I, in 1868, explained at some length the grounds upon which my view of the case was founded; and, although few naturalists were then disposed to accept it, the truth of what was

then advanced as in the highest degree probable has since been incontestably demonstrated by the observations of Mr. Mansel Weale, who, in 1873, reared all the four forms from eggs laid on the white iron-wood (*Vepris lanceolata*) by a specimen of *P. cenea*. Mr. Weale's researches and their result have recently been confirmed by Colonel Bowker's notes on the sexes in Natal.

We have thus the remarkable case of a butterfly, in which the male is of a certain conspicuous and unusual coloration, which varies but little, while the female is of three quite different forms, each of which is entirely unlike the male, but imitates one of the three prevalent species of *Danainæ* inhabiting South Africa! It should be added that numerous intermediate variations of the females exist, which exhibit a series of links between the three prominent forms, and serve to indicate how plastic for further development in any advantageous direction the polymorphic female *P. cenea* remains.

Other circumstances which add to the great interest of the case are (1) that the very closely-allied true *Papilio merope* of Western Africa also has a polymorphic female, several forms of which have been described as distinct species, and are found imitative of *Danainæ* inhabiting the same region; and (2) that in Madagascar the likewise closely-related *Papilio meriones* has but one form of female, and that form slightly different from the male! What is even more surprising is the fact, communicated to me by Mr. Ch. Oberthür in 1882, that the representative of *Papilio merope* at Lake Tsana, in Abyssinia, also has the sexes almost exactly alike. The inference is obvious that the females in Madagascar and Abyssinia for some reason do not stand in need of the protective disguises so elaborately worked out for them in Southern and Western Africa. Probably some active persecutors of this large pale type of *Papilio* are absent in those countries, or may there have found some easier or more attractive insect prey. In S. Africa the handsome flycatcher, *Tehitrea cristata*, has been seen by Mr. Weale to capture the male *P. cenea*, and he had reason to suspect a bird of an allied family and quite similar habits, *Dicrurus musicus*, to be another of this butterfly's enemies. Insectivorous birds of both these genera are found in Abyssinia—the very same species of *Dicrurus* is, I believe, a native of that country—and also in Madagascar; but it is possible that circumstances may have led to their leaving *Papilio merope* and *P. meriones* unmolested.

We have seen that there are certain cases in which insects escape by simulating the aspect of the very enemies that persecute their tribe, as, for instance, the Scaphuræ of South America imitate the sand-wasps, which provision their nests with crickets; but there is a kindred class of mimicries, not very common, in which the advantage is reversed, the rapacious enemy, like the wolf in sheep's clothing, wearing the appearance of the creatures on which it preys. The Mantis family present some good cases of this description, Mr. Bates recording one occurring on the Amazon River, in which a Mantis exactly resembled the "white ants" (*Termes* sp.) on which it fed. I suspect that a very slender pale Mantis, which I met with in Natal, and which very closely imitated the appearance of certain Phasmidæ, was probably so disguised to enable it to prey more easily on the weak *Bacilli* of the same district. In this Mantis the rapacious fore paws were so formed and held as to hide their real character, and I took it for a *Bacillus* on first seeing it. Hunting spiders are in some cases very like their prey, as may everywhere be noticed in the case of the species of *Salticus*, which catch horseflies on sunny walls and fences. The likeness is not in itself more than a general one of size, form, and colouring; but its effect is greatly aided by the actions of the spider, which walks hurriedly for short distances, stopping abruptly, and rapidly moving its falces, in evident mimicry of the well-known movements characteristic of flies. Many spiders exhibit a strong resemblance to ants, and Mr. Wallace states that those of one tropical genus which feed on ants are exactly like their prey.

Having now rapidly glanced at some of the more prominent instances of the various descriptions of protective resemblance existing in Nature, it only remains for me to repeat my conviction that upon the theory of "natural selection" alone are they at all explicable. If we assume the independent creation of all species of organic beings precisely as we now behold them, it is impossible to understand why there should have been this system of disguises at all. If from the very first the destined prey of other animals possessed in every case the appearance we now find them possessing, would the resemblances we have been considering have protected them in the least? Can it be supposed that certain species of butterflies were created in great abundance,

and that certain other species of widely different structure, but superficially imitating the former, were simultaneously created in very small numbers, in order to maintain a precarious existence for ever afterwards? What is the meaning, on this view, of all the gradations in protective resemblance, the incompleteness or imperfection of some mimicries? To these and many other questions that readily occur to us, no satisfactory reply can be made, if it be insisted on that species are immutable, and that the organic world is now in all respects exactly the same as when it sprang into being. But these problems become intelligible when viewed as the natural consequences of the innate variability of species, and the preservation and development by inheritance, through all time and under all changes in surrounding conditions, of every successive variation advantageous to the organism originating it.*

NOTES ON THE CAPTURE AND PRESERVATION OF COLEOPTERA.

BY LYONELL FANSHAWE.

I.—APPARATUS. COLLECTING IN WINTER.

IN offering the following notes upon the capture and preservation of Coleoptera to the readers of the 'Entomologist,' my object is to encourage recruits to the study of this branch of Entomology so much neglected by British insect collectors. The first difficulty found by many who would like to investigate the mysteries of an unknown group of insects, is usually how to commence. The manner of this has to a large extent been already set forth by writers on the subject of Coleoptera, such as Rye, in 'British Beetles,' chapters vi. and vii.; Newman, in 'The Insect Hunter's Companion' (3rd edition); Fowler, in his series of papers in vols. xv. and xvi. of this Magazine; and other authors elsewhere. Though I may be thought to be treading too closely in the footprints of some of the later writers on this portion of the subject, I venture to think that the following hints on the best ways of finding and preserving

* Part of an Address delivered at the Annual Meeting of the South African Philosophical Society.

beetles may be found to be new to some who have not before thought of taking up the subject, or may refresh the flagging interest of others who are wavering between the Coleoptera and their old loves, the Lepidoptera.

The instruments required for the capture of Coleoptera are both simple and inexpensive. First of all, two nets will be required of the size of an ordinary butterfly-net, one made of strong material for sweeping herbage, and the other of "cheese-cloth," for water-work. Round the top of the net must be sewn a band of linen or holland, into which the ring will slide. If this is not provided the net itself would wear out almost immediately from continual sweeping. The ordinary iron ring bought at any naturalists' shop is the most serviceable, as the work is often rather rough, especially among long grass or weeds, and the more elaborate nets soon get worn out.

Secondly, a "digger" for ripping off the bark of trees, made according to the following plan. Those sold in naturalists' shops are utterly useless. It should be "something in the shape of a mattock, the blade trowel-shaped and slightly curved, and a broad hammer taking the place of the prongs. The blade must be very strong and sharp-edged, and the handle should be prolonged into a sort of crowbar with rather a sharp edge, so as to be able to use it as a chisel and lever united." This is the Rev. J. G. Wood's description; and, though certainly rather heavy, it will be found a most serviceable tool.

Thirdly, a wide-mouthed bottle with close-fitting cork. Bore a hole through the cork, and into this firmly secure a short thick quill, also having a cork in it, and one which can be readily withdrawn with the teeth. By this means the small species can be quickly popped in through the quill, without taking out the larger cork each time. In the bottle, place some well-pounded fresh laurel leaves, covered with a piece of cardboard firmly pressed down and fitting close to the bottle. In the cardboard pierce a number of small holes to let the fumes of the laurel escape into the bottle.

Fourthly, a pair of forceps. These should be made of steel, and with a curve in them, so that they can be pushed into corners where straight forceps could not reach.

These, with the addition of a few pill-boxes, and a small closely-stoppered bottle of spirits of wine, will be everything a collector will find necessary for a successful season.

In the winter months, from January to March, a greater deal more can be done than is generally supposed, more, in fact, than in any other order of insects; and I will try to enumerate most of the best places to find them at this time of the year.

Moss is a never-failing harbour for Coleoptera in the winter, and always yields a large quantity of species, especially those minute ones which are difficult to capture otherwise. When in want of employment, go out into a wood or along a hedgerow, and collect into a large bag, taken for the purpose, all the moss that can be found; when this is filled take it home, and pull it apart thoroughly, piece by piece, over a large sheet of white paper or a sheet. Each piece must be well beaten and torn about, as some of the occupants are exceedingly difficult to dislodge. One of the best store-houses for a coleopterist is a dead or dying tree or log with the bark on, but loose. When out for a stroll always be on the look-out for these, and note their whereabouts in your mind. By far the most productive trees are those having a rough bark; the beetles are very fond of getting up into the cracks and notches on these trees.

Having arrived at a likely-looking tree, let us begin operations. It is a good plan to begin at one end and work steadily along it, tearing off every scrap of bark as you go, and examining both the bark *and* the trunk. If only one be examined, the trunk *or* the bark, many species will be lost. The before-mentioned digger will be found very useful for this work. When all the bark is off, pull back and examine closely the herbage growing by the sides, and finally, if possible, turn the tree over and examine the ground under it. I have found an old decaying willow literally swarming with *Sinodendron cylindricum*, male and female, and all perfectly torpid.

After having broken up and inspected any rotten wood that can be got at, the tree can be fairly left as "done for;" and left it should be, with an ample harvest in the bottle of the energetic collector.

Whenever a stone is met with, of whatever size, it should be lifted up and examined, with the ground under it; many species of Coleoptera are seldom found except in these places. Bricks and tiles, for some reason, hardly ever harbour anything.

The bark on palings and posts, and the crevices about them, should never be passed over.

A ploughed field also frequently contains a great number of beetles. Turn over all the large loose clods of earth round the edges of the field; it is curious that only very seldom is anything found under the clods towards the centre. Hosts of *Staphylinidæ* and others are thus brought to light.

In many counties that contain large rivers, floods are not infrequent, and after a heavy flood has just begun to subside is a great day for the beetle-hunter. By means of the water Coleoptera of every family are flooded from their homes, wherever they may be, and so specimens of each order may be caught. Many species, too, are night-flyers only, and therefore would be almost impossible to capture were it not for this and "light." In the corners of fields by the hedges, and where there is no current of wind, quantities of vegetation, sticks, old leaves, and the like, will collect: these are the places where the spoils chiefly lie. This refuse may either be examined on the spot, or, better still, taken home, like moss, and examined at leisure.

Another very productive locality, and one that appears to be very little known and hunted, is the remains of hay, dust, seeds, &c., which are left after the haystack itself has been removed. This, like everything else in beetle-hunting, must be well and closely examined, and not only turned roughly over and then left.

All animal and garden-refuse, too, contains its own peculiar genera of Coleoptera, which will be found here and nowhere else; and, if the collector desires to have series of these, he must seek them in their rather disagreeable haunts. A good and easy way of obtaining them, is to plunge the refuse into water and stir it about; the beetles will all rise to the surface, and can then be captured without trouble.

An unfailing attraction to all the *Necrophaga* is a dead animal, bird, or fish.

A great prize is a fine rook or hen some time deceased, and beginning to smell unpleasantly strong. They deserve to be overhauled, and to have their locality marked with as great joy as the *Necrophorus* himself. Having discovered one of these tempting baits, lift it carefully up by a leg (or get a friend to do so!), and examine the ground whereon it lay. Then spread a cloth or large sheet of white paper on the ground, tap the bait sharply with a stick, and the collector ought to be amply rewarded for his unsavoury task. Dead animals should be visited, if

possible, at night, as many of the *Necrophaga* are night-flyers. I strongly recommend anyone unacquainted with the habits of the Necrophori, not to touch them when alive (but to pick them up with the forceps), as they often emit a most foetid brown liquid, which smells horribly for days, and even stains the skin. When the dead animal has given up all his tenants, replace it in the same spot, and in a day or two it will be full again. A dead cat or dog by the riverside is very productive, as is decaying seaweed on the coast. Old bones and skins contain species that are found nowhere else; also sand-pits, salt-marshes, and brackish places.

Every pond, stream, and ditch, will be found to be teeming with our friends. Having arrived at a weedy pond, take out the net made of cheese-cloth and slide it on to the iron ring, screw the ring to a corresponding screw fitted on to the stick, and all is ready. The net should only be dragged about among the weeds and vegetation, not down into the mud below, or the work becomes hopeless. Be very careful of handling the *Gyrinidæ*, or "Whirligig Beetles," as they also, like the Necrophori, emit a milky fluid, which smells disgustingly for a long time.

Flood-water, which has been spoken of before, may be worked in the same manner as ponds, &c.; but it is only necessary here to skim merely the surface, as almost all the beetles will be land-beetles, and therefore float. Do not net the sticks, &c., mentioned above, but simply draw your net through the clear water, which apparently contains nothing, but which in reality contains many a beetle, though they at first escape your notice. The growing herbage, however, may be scraped, as the insects cling to it. A good pair of Dowie and Marshall's water-tight boots will be found of great advantage for this sort of work.

Under heaps of old sticks and faggots lurk many curious beetles. Shake and rap the bundles well, and examine the ground whereon they stood. Also cut osiers stacked for some time will be found to contain many species; but this belongs to summer hunting, of which I purpose to give an account in a future number of this magazine.

I have now, I think, briefly noted the principal localities where Coleoptera may be found in winter, with the exception of light: this is a very great attraction nearly all the year round. Many beetles, as already mentioned, are night-flyers, and can

only be secured by this means, or by the flood-waters. The method is the same as that employed for attracting moths, *viz.*: Stand a strong duplex lamp with a reflector behind just inside the window, and another (this without a reflector) further within the room; and then, with the implements of capture and of death ready close by, there is nothing to be done but to await the visits of your guests, whose arrival will begin about dusk and continue until the small hours of the morning.

2, Halkin Street West, Belgrave Square, London, S.W.

(To be continued.)

LEPIDOPTERA IN KENT.

By J. W. TUTT.

I HAVE noticed that some contributors to the 'Entomologist' complain of the dearth of insects at sugar during the past season. My experience—collecting in North Kent and the neighbourhoods of Sandwich and Deal—has been decidedly contrary to this opinion, Noctuæ having been generally abundant; and in the Sandwich district on some evenings not only were they abundant, but other orders of Lepidoptera were frequently represented. One of the most successful night's work was that on August 6th, and the following summary of the night's work will show that not only are Noctuæ fond of the "rum and treacle," but that almost all the other families have some members at any rate that share the same taste.

The species taken at sugar, arranged in their families, were:—

DIURNI.—*Vanessa urticæ*.

NOCTURNI.—*Lithosia lutarella* v. *pygmæola*.

NOCTUÆ (42).—*Bryophila perla*, *Acronycta rumicis*, *Leucania impura*, *L. pallens*, *Hydroecia nictitans*, *Xylophasia lithoxylea*, *X. sublustris*, *X. monoglypha* (polyodon), *Cerigo matura* (cytherea), *Luperina testacea*, *Mamestra brassicæ*, *Apamea leucostigma* v. *fibrosa*, *A. didyma* (oculea), *Miana strigilis*, *M. literosa*, *M. bicoloria* (furuncula), *Caradrina quadripunctata* (cubicularis), *Agrotis vestigialis* (valligera), *A. puta*, *A. suffusa*, *A. segetum*, *A. nigricans*, *A. tritici*, *A. aquilina*, *Triphæna ianthina*, *T. comes* (orbona), *T. pronuba*, *Noctua plecta*, *N. c-nigrum*, *N. rubi*, *N. umbrosa*, *N. xanthographa*, *Orthosia upsilon*, *Calymnia trapezina*, *Phlogophora meticulosa*, *Hadena trifolii* (chenopodii), *H. oleracea*, *Gonoptera libatrix*, *Amphipyra pyramidea*, *A. tragopogonis*, *Mania typica*, *Rivula sericealis*; also one other species, about which I am still uncertain.

GEOMETRÆ (11).—*Epione apiciaria*, *Boarmia gemmaria* (*rhomboidaria*), *Acidalia emutaria*, *A. imitaria*, *Aspilates ochrearia* (*citraria*), *Eupithecia subfulvata*, *Melanippe fluctuata*, *Eubolia limitata* (*mensuraria*), *E. virgata* (*lineolata*), *Phibalapteryx vittata* (*lignata*), *Coremia ferrugata*.

PYRALIDES (3).—*Scoparia cratægella*, *S. pallida*, *Nemophila noctuella* (*hybridalis*).

PTEROPHORINA.—*Pterophorus monodactylus* (*pterodactylus*).

ALUCITIDÆ.—*Alucita hexadactyla* (*polydactyla*).

CRAMBIDÆ (4).—*Crambus selasellus*, *C. tristellus*, *C. geniculeus*, *Melissoblastes anellus*.

TORTRICES (10).—*Tortrix podana*, *T. heparana*, *T. costana*, *Peronea variegana*, *Teras contaminana*, *Dictyopteryx holmiana*, *Sericoris urticana*, *Sciaphila subjectana*, *Bactra lanceolana*, *Hypermercia cruciana*.

TINEINA (16).—*Swammerdamia oxyacanthella*, *Depressaria flavella*, *D. assimilella*, *D. arenella*, *D. applana*, *D. yeatiana*, *D. pulcherimella*, *D. badiella*, *D. discipunctella*, *Bryotropha desertella*, *Lita acuminatella*, *L. marmorea*, *Teleia vulgella*, and three other species not determined.

A friend worked the above locality with me, and we made out the above list because the number of species in the different families (except the Noctuæ) were exceptional; although on almost every evening we "sugared" there were some members of the other families quite regular in appearance, *L. pygmæola*, *E. limitata* (*mensuraria*), *P. vittata* (*lignata*), most of the Tortrices and Tineina named, and *P. monodactyla* being regular visitors. Some of the species, on the other hand, occurred on no other evening, and therefore their appearance may have been due to chance, as I only took one of each species, although I know most of the insects were occurring freely in the locality: such species were *V. urticæ*, *A. ochrearia*, *E. apiciaria*, *M. anellus*, and *S. pallida*. *R. sericealis* and *A. hexadactyla* also occurred once, but as I have taken both previously at sugar I believe they are, to a certain extent, regular attendants at the sweets.

Insect life was exceedingly abundant, and some of the species of Noctuæ swarmed. Some of the local forms of the Noctuæ of the S.E. district are remarkably fine, and differ much from the forms of the same species in other parts of Kent. Among the best species taken at sugar in the district during our stay was *Leucania albipuncta*, two, both taken by my friend, and a specimen of *Nonagria sparganii* flying near a ditch, also taken by my more fortunate companion. My friend, not being well up in Entomology, had set these, and they were packed away with our other captures; and it was not until my arrival home that I discovered

what he had taken. Two *Doryphora palustrella* were also taken; a *Noctua* that I cannot yet determine; a *Eupithecia*, which still puzzles me, closely resembling *E. vulgata* in ground colour, but with longer wings (probably larvæ-fed on mugwort, as I obtained the two specimens from that plant); and a worn specimen of *Anerastia farrella* also occurred. *Lithosia pygmæola* was abundant on the sand-hills; on one evening I collected above sixty in a short time. I did not work for them any other evening, although I picked them up all over the sand-hills when after other species. They were still out the third week of August.

My experience in other parts of Kent has been very similar, the great exception being *Nola albulalis*. This species this season was undoubtedly rare in all stages in its old locality. I could get scarcely a larva, where two years ago I could have taken dozens in a short time had I been so disposed; and although I was several times on the ground when the imago should have been out I netted only three. A friend who was on the ground regularly says that scarcely any could be obtained. The restricted locality of the species, the ease with which the larva can be found, and the systematic way in which the species has been worked since its discovery, has undoubtedly had much to do with this; and unless the species be more leniently treated for the next few years it looks very much like being exterminated in its old haunts.

The marshes on the banks of the Thames gave a fine lot of *Leucania phragmitidis*, with a few of the beautiful red var. *rufescens*. *Leucania straminea* was in fine condition during July. I bred this species from larvæ feeding on the reeds the second week in July, during the time that the imago was on the wing, the pupal state only lasting from nine to twelve days. Other species also occurred freely; and, on the whole, I believe this has been, in North Kent, the best season since I recommenced collecting in 1880, although insects have been fairly abundant the previous years, and no entomological collapse has occurred, as there seems to have been in other parts of the country.

In conclusion I may add that *Acherontia atropos* has occurred freely in the potato-fields of North Kent during the autumn, although but a small percentage of imagines have been bred.

Beaconsfield Terrace, East Greenwich, January 3, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

SOARING HABIT OF *VANESSA ATALANTA*.—With regard to Mr. Martin J. Harding's note (Entom. xviii. 51), my impression, gathered from my own observation, is that *V. atalanta* is impelled to a more soaring flight during hot seasons than during cooler summers. The first occasion on which I noticed its soaring flight was about the middle of September, 1876, when, as I was taking a ramble through the fields at Ashmore Park, about three miles from Wolverhampton, I saw it in some plenty skimming over the tops of the oak trees, greatly resembling, in flight, *Apatura iris*. They darted through the air with a rapid motion high above the tops of the trees, and then, darting suddenly down on to the clover flowers in the field below, they rested for a moment, and then took another flight over the tops of the trees. While resting on the flowers was the only chance given for a capture. During August and September of that season it was very hot. Although I have seen *V. atalanta* in some plenty in more recent seasons, I have not observed such a soaring flight as on that occasion.—THOS. HILL; March End, Wednesfield, near Wolverhampton.

GONEPTERYX RHAMNI IN DORSETSHIRE.—I recommend Mr. Mansfield (Entom. xvi. 271; xvii. 271) to read Mr. Mansel Pleydell's 'Flora of Dorset,' and Newman's 'British Butterflies.' The larva possibly feeds on blackthorn as well as on buckthorn. In the forthcoming "Lepidoptera of Dorset" it will be recorded as one of the commonest butterflies.—C. W. DALE; Glanvilles Wootton, Sherborne, Dorset, February, 1885.

LUPERINA DUMERILII.—In reply to Mr. Hodgkinson's enquiry (Entom. xviii. 54), I beg to say that I have a specimen of this moth, which was captured in 1858 in the Isle of Portland, by Mr. William Farren, of Cambridge. In Stainton's 'Manual,' i. 206 (1857), it is said that "one specimen only has occurred, in the Isle of Arran"; and in Newman's 'British Moths,' p. 297 (1869), we read that "two specimens of the moth are said to have been taken in the Isle of Portland, by Mr. Seeley; one of them is in Mr. Bond's collection." This, doubtless, refers to Mr. A. F. Sealy, now in South India, who certainly had the two specimens, as I well remember, though I rather doubt whether

he was himself the captor. Be this as it may, Mr. Sealy and I, in 1858, joined with two or three others, then at Cambridge, in sending Mr. Farren on a collecting expedition to the New Forest, Portland, and elsewhere, which resulted in the capture of a specimen of *L. dumerilii*, which fell to my lot on the division of the spoil. To the best of my recollection it was the only specimen taken in 1858, and it has ever since been in my possession, but unfortunately is in poor condition.—J. W. DUNNING; 12, Old Square, Lincoln's Inn, February, 1885.

LUPERINA DUMERILII.—I notice in last month's 'Entomologist' (Entom. xviii. 54) that Mr. J. B. Hodgkinson asks for confirmation of the capture of *Luperina dumerilii*. I am pleased to be able to give him the information that in September, 1858, in company with Mr. A. F. Sealy, I took two specimens in the South of England; one of these was in Mr. Sealy's collection, the other went to that of Mr. Frederick Bond. The next year I took three more in the same locality; one I gave to my friend Alfred Fryer, which I believe is still in his cabinet; I forget where the other two went to, but I think one went to the Rev. H. Burney.—W. FARREN; 14, King's Parade, Cambridge.

LEPIDOPTERA AT LIGHT IN 1884.—Seeing several letters in your columns on the above subject, I may state that my brother and I took at light last summer, at the under-mentioned address (by simply placing an ordinary lamp on a table next a back window overlooking the garden), seventy-five species of Macro-Lepidoptera, including *Smerinthus populi*, *Nonagria geminipuncta*, *Dipterygia scabriuscula* (*pinastri*), *Neuronia popularis*, *Mamestra sordida* (*anceps*), *Apamea gemina*, *A. ophiogramma*, *Caradrina morpheus* (very abundant), *C. alsines*, *C. taraxaci* (*blanda*), *Agrotis tritici*, *Hadena trifolii* (*chenopodii*), *Plusia chrysitis*, *Catocala nupta*, *Epione apiciaria*, *Melanippe rivata*, *Cidaria truncata* (*russata*) var. *comma-notata*, &c.—E. B. BISHOP; 3, Primrose Terrace, George Lane, Woodford, Essex, January 24, 1885.

THE URTICATING HAIRS OF LEPIDOPTERA.—As this subject seems to have aroused some interest, I may mention that I have experienced the disagreeable symptoms described by Mr. South from handling empty cocoons of *Porthesia similis* (*chrysorrhœa*), which I found on a fence at Beckenham, on September 25th, 1880. Now as these cocoons had probably been empty and exposed to

the weather for months, I think this militates strongly against the theory of the effects being caused otherwise than by the mechanical properties of the hairs.—T. D. A. COCKERELL; Bedford Park, Chiswick, February, 1885.

ON THE VARIATION OF *EUPITHECIA NANATA*.—After Mr. Gregson's remarkable statements (Entom. xviii. 52) with regard to his own farsightedness in discriminating specific differences which other entomologists fail to see, I must say I am surprised at his statement that he has "only seen three varieties of *E. nanata*," and these are all in his own cabinet. There must have been a general overhauling of the "many thousands of bred and captured specimens" for varieties before Mr. Gregson's careful search began, or otherwise the "many thousands" must have come from one particular spot where the insect does not vary. This, however, does not satisfactorily prove that the species does not vary, and I can assert that many varieties are taken with the type, every season, in the neighbourhood of Garelochhead, twenty-five miles N.W. of Glasgow, many of which, were they mixed up with the var. *curzoni*, could not be separated from it, so far as the actual appearance of the insects is concerned. Further than this, a dull heavy coloured variety is found in the same locality, which, I believe, is the var. *obscurata*. Mr. Gregson also makes much of the difference in the shape of the wings, but the Garelochhead *E. nanata* vary much in this respect (especially the duller form mentioned); many closely resembling the var. *callunaria* of *E. satyrata*, from the same locality, in the shape of the fore wings. Looking, therefore, at the wide range of variation in the species, only as far north as Glasgow, and the undoubted change that the species has undergone towards the establishment of permanent variation there, how much more likely that the species, in its isolated northern localities, should develop into an actual permanent variety? The only point that can be taken as a satisfactory feature, in determining *E. curzoni* as a species, is the distinct larva; but Mr. McArthur states that he bred all forms, varying from "the southern form to the dark-banded *curzoni*;" and I should presume from his remarks (Entom. xvii. 277) that he noticed no difference in the larvæ from which he bred all the intermediate and extreme forms. If it can be proved that the larva (so-called) of *E. curzoni* is distinct, and that typical *nanata* cannot be bred from the same peculiar form

of larvæ, I think entomologists would accept it as a species with better grace; but until then entomologists have a perfect right to be cautious in admitting *E. curzoni* to specific distinction. For myself, I cannot see so great a difference between the *nanata* type and its var. *curzoni* as between the typical *Noctua glareosa* and its Shetland form, and certainly not more than between the type *Melanippe montanata* and its var. *shetlandica*; yet no one has attempted to raise them to specific distinction. The genus *Eupithecia* appears peculiarly unhappy in this respect. Being rather more obscure than the other genera of Macro-Lepidoptera, it seems that certain collectors try experiments on it, which could not perhaps be carried out on other genera with the same chance of success.—J. TUTT; 45, Beaconsfield Terrace, Greenwich, S.E., February 2, 1885.

EUPITHECIA CURZONI.—The only specimens of the Shetland “pug” I saw at Mr. Capper’s I pronounced at once northern forms of *E. satyrata*; there is something, to a trained eye, that cannot well be described. As to its being, as Mr. Gregson says, the narrow-winged “pug,” that is out of the question. Some thirty years ago, on the bank at Witherslack, I took what I thought to be a new “pug,” a shining light leaden-coloured “pug.” I sent them to Doubleday, and he wrote me that they came near to the Norwegian form of *E. satyrata* (then *callunaria*). Since then the species, at the same place, partakes more of the characters we get in the woods at Grange; the larva always on the ox-eye daisy flowers. My Scotch *E. callunaria* have all the characters of the Shetland species, only not so extreme in variation. But consider how different are the Shetland forms of *Noctua glareosa*,—whilst these are black, ours are lilac-coloured.—J. B. HODGKINSON; Preston, July 11, 1885.

SCIENTIFIC NOMENCLATURE.—Since the publication of my remarks on scientific nomenclature, in the February number of the ‘Entomologist’ (Entom. xviii. 46), it has been pointed out to me that the form in *-ensis* is employed, as a rule, only for adjectives derived from names of *places*, and that *gregsoniana* is the correct adjectival form in Latin of Mr. Gregson’s name. His recent discovery should therefore be named *Eupithecia curzoniana*. Having received a letter from Mr. Gregson to the effect that the statement “anything will do for a name” does not occur anywhere

in his recent pamphlet, I should like to say that the quotation in question was taken from a review on the same, which in these words really gave the gist of his arguments.—HERBERT CHITTY; Balliol College, Oxford, February 13, 1885.

EXCHANGING OR GIVING AWAY.—I have read with much interest the views of your correspondents as to exchanging or giving away duplicate specimens. Will you kindly spare me space, as one having experience, for a few words on the subject. One of your correspondents laments the "good old days," and the rarity of generosity now-a-days. Another expresses his contempt for outsiders and beginners. I am at one with him as to the picture-makers. But how about the beginners? Ten years ago, scarcely "the good old days," at the conclusion of a little paper, which the then Editor kindly inserted in your useful periodical, I offered some series of a species which I took plentifully, and which I found afterwards was comparatively local. I was surprised, as was the postman, at the number of postal boxes sent for them. Among the applicants many truly were beginners, and may be some were outsiders; but many also were old and well-known entomologists. I have since renewed the offer annually, and have sent the species to more than 250 applicants. I do not say this in self-glorification, but that I may induce others to follow the example, and take the trouble, for trouble it certainly is, to *give*, not merely exchange, any duplicates they may spare. Let not older entomologists forget the time when they, as beginners, were so grateful for the gift and delighted by the beauty of a *Thyatira derasa*, by the pale loveliness of a *Uropteryx sambucata*, or the brilliancy of *Venilia macularia*; and let them, when able, confer that pleasure on others. And may I add, to take a lower stand-point, "giving away" brings other rewards; for the acquaintance, and sometimes the friendship, of well-known entomologists I feel myself indebted to my offers of even so small an insect as *Polia flavicincta*. "Small kindnesses sometimes meet with great rewards."—(Dr.) H. W. LIVETT; Wells, Somerset, February 6, 1885.

EXCHANGING AND COLLECTING INSECTS.—Allow me to say that I fully concur with Mr. Coverdale in his statement on exchanging. It does indeed seem as if the good old entomological spirit was fast fading into nothing but commercial enterprise,

which, to my mind, only tends to make this truly enlightening science uninteresting. I certainly value a specimen of my own catching far before one purchased, or an exchange either; to say nothing of the contempt with which I view that ambitious feeling of who shall make the most complete collection. If working up the insect fauna in different districts were more encouraged, entomology would be taken up in a far healthier spirit than it is at present; and if I were only possessed of the means of some of my more fortunate brother entomologists, I would certainly offer a prize once a year to each Society for the finest local collection of all orders of insects, proved to be the collector's own collecting. I think I should then prove the fact that he would have greater pleasure for his pains, and learn more by closer examination of the hunting-grounds of his neighbourhood than by wandering a hundred miles away in search of a hidden treasure he has already probably passed in his daily walks. London entomologists, especially, have, within easy reach, as fine and varied fields of operation as anyone could possibly wish. To prove my argument, with the editor's permission, I will give, in an early number of the 'Entomologist,' a list of Macro- and Micro-Lepidoptera that I have taken within five miles of the Marble Arch.—H. SHARP; 37, Union Street, Portland Place.

[By all means, if accompanied by notes and localities.—ED.]

"BY MUTUAL CONFIDENCE AND MUTUAL AID."—It often happens that when an entomologist visits a strange place for a short holiday he either does not know at all what insects may be expected, or knowing that certain local species do occur in the neighbourhood, he cannot find the locality; and it is perhaps not until after he has left that he finds that there was a fellow-entomologist living in the district who could have given him the very information he needed. Would it not be possible to publish occasionally in the 'Entomologist' a list of names and addresses of gentlemen who would be willing to render assistance in this way to strangers visiting their district? Of course such a plan is open to the objection that some species would be exterminated if the locality where they occur were generally known. Still each one could use his own judgment as to how much it was wise to disclose in each individual case; and without disclosing any of his "pet localities" he might render very valuable and welcome

assistance to occasional visitors. I, for one, should be very pleased to give any information I could to entomologists visiting Bournemouth or neighbourhood.—P. M. BRIGHT; Roccabruna, Branksome Wood Road, Bournemouth.

LOCAL LIST OF INSECTS.—It is proposed, in connection with the Bournemouth Society of Natural History, to publish a list of the Lepidoptera occurring in the Bournemouth district. If any who have been working here or in the neighbourhood at any time would kindly put themselves into communication with me I should feel extremely obliged. Help is especially required in the Micro-Lepidoptera.—P. BRIGHT; Roccabruna, Branksome Wood Road, Bournemouth.

[We hope in this instance a good model for the proposed list may be followed, such as Mr. Porritt's Yorkshire list. It is with great regret we have recently received more than one local list of insects, which must have cost the compilers much time and trouble, but which are all but useless, being mere lists of names, without the addition of useful notes.—ED.]

ERRATUM.—P. 48, for A. CHITTY read H. CHITTY.

OBITUARY.

EDWARD CALDWELL RYE died February 7th, 1885, in the Stockwell Hospital, after a few days' illness, from a virulent attack of smallpox. His age was about fifty-three. The late Mr. Rye's father was a solicitor in Golden Square, London; and the subject of this notice was also intended for the law, being articled to his parent. Having, however, great distaste for that profession he abandoned it before being admitted a solicitor, and studied in surgery, and the knowledge of anatomy, obtained during these latter studies, became most useful to him in his after investigations into insect structure. When about thirteen years of age Mr. Rye was introduced by William Yarrell to Mr. Janson, who rapidly formed his general taste for Entomology into a systematic study of British Coleoptera. This he followed for many years, first coming before the entomological public as an exhibitor of new Coleoptera at the meetings of the Entomological Society. After Mr. Janson ceased to edit the section

Coleoptera in the 'Entomologist's Annual,' Mr. Rye (in 1863) took it in charge, and continued its editor until the Annual ceased. In 1866 'Rye's British Beetles' appeared, as one of Lovell Reeve's series of Natural-History works. This work is so well-known to coleopterists that comment upon it is unnecessary. Mr. Rye contributed several articles on different orders of insects to the 'Encyclopedia Britannica,' his best probably being on Diptera; and was from its establishment one of the editors of the 'Entomologist's Monthly Magazine.' The subject of our memoir was also editor of the departments of Travel and Entomology of the 'Field' newspaper, and contributed largely to the journal, 'Home and Colonial Mail;' but his greatest work was in connection with the 'Zoological Record,' with which he was first associated as editor of the entomological section, but afterwards (in 1873) became editor-in-chief, which post he retained until his death. This position made him thoroughly conversant with Natural-History bibliography; and his untimely death will in consequence be severely felt among all English speaking Natural-History students. In February, 1874, Mr. Rye was appointed Librarian of the Royal Geographical Society, after which his active attention to Coleoptera waned, and he shortly afterwards disposed of his collection, which was one of the best of his time, to Dr. P. B. Mason, of Burton-on-Trent. He took little interest in exotic Coleoptera, but described about a score species new to Britain, nearly all of which are still recognised as good species; in fact whatever work he took in hand was thorough and trustworthy. Mr. Rye was a very fair artist in entomological subjects, and his clever caricature drawings were well known among his friends. He was fond of athletics, especially walking and rowing, and following the latter pursuit nearly cost his life some four years ago, when he was severely crushed on the River Thames between a steamer and a barge. Mr. Rye married a daughter of Mr. G. R. Waterhouse, then Keeper of the Palæontological Department of the British Museum, who survives him. He leaves four children, the eldest of whom is, we believe, studying electrical engineering with one of the Atlantic Cable Companies. His sister, Miss Rye, is well-known in connection with female emigration to Canada.—J. T. C.

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ON SOME PROBABLE CAUSES OF A TENDENCY TO
MELANIC VARIATION IN LEPIDOPTERA OF HIGH
LATITUDES, BY THE RIGHT HONOURABLE LORD
WALSINGHAM, M.A.*

THIS address is a most welcome and instructive addition to that branch of entomological literature which deals with variation in the colour of insects.

Melanic variation as exhibited in Lepidoptera from high northern latitudes is chiefly dealt with, but similar variations of colour in those from high altitudes are adverted to, and topomorphic variations are incidentally mentioned.

Speaking of the Lepidoptera of the Shetland Islands, Lord Walsingham says:—

“The tendency of this variation has in almost all instances been in the direction of melanism (except in the more southern and western island of Arran), exhibiting a preponderance of darkened scales or a suffusion of the markings, in many cases almost obliterating the paler portions of the wing. Among the species exhibiting this tendency in a greater or less degree may be mentioned *Hepialus veileda*, *H. humuli*, *Noctua festiva*, *N. xanthographa*, *Agrotis cursoria*, *A. porphyrea*, *A. lucernea*, *Dianthæcia conspersa*, *Emmlesia albulata*, *Eupithecia venosata*, *E. nanata*, *Melanippe montanata*, *M. fluctuata*, *Camptogramma bilineata*, &c. This same tendency is observable in the majority of the Lepidoptera, and, I believe, of the Coleoptera of the whole Arctic and sub-Arctic regions when contrasted with their more southern representatives.”

* Being the Annual Address of the President to the Members of the Yorkshire Naturalists' Union, at Doncaster, March 3, 1885.

A similar melanic tendency in the colour of those from mountainous districts is thus mentioned :—

“It is worthy of remark that where the atmospheric conditions in any degree approach to those of the more northern regions, as they do on high mountain ranges, at varying elevations according to the degree of latitude, the same tendency to assume a darker or more suffused colouring is very observable.

“Mr. W. A. Forbes remarks,* ‘In looking through Dr. Staudinger’s catalogue I was much struck by the fact that in nearly every case where a local form (whether a variety or aberration) from the Alps is noticed, it is characterised as being *obscurior* or *multo-obscurior*, or with some of the markings *obsoleta*.’ He goes on to notice the number of normally black or dark species in the Alps, e. g., *Erebia*, *Psodos*, and some *Pyalides*.”

The author then states that various theories have been advanced at different times, and by different authors, to account for variation in animals, birds, and insects, and it has been attempted to apply some of these to the phenomena which he proposes to consider :—

“I. Since Darwin drew attention to this cause, the theory of protective resemblance has been most commonly made use of to account for the varied coloration of insect forms. It has been proved almost to demonstration in many instances, that by more or less gradually developed assimilation to surrounding objects, those varieties best adapted to escape the observation of natural enemies have become perpetuated.

“II. Many instances of varied colouring have been referred to an archaic origin; that is, to the preservation of such varieties by hereditary transmission from an ancestral source.

“III. The influence of quality and quantity of food has been brought forward to account for modifications of normal colouring.

“IV. Retarded or accelerated development depending upon climatic conditions acting upon insects in their larval or pupal stages has also been quoted as a cause for variation.

“V. Insular varieties have been attributed to the effects of long isolation and segregation tending to establish special races.

“VI. Atmospheric electricity has also been called into requisition to account for certain changes.

“VII. Mr. Geo. Lewis has argued† that exposure to more or less direct action of the sun’s rays may influence colour by acting mechanically upon

* ‘Entomologists’ Monthly Magazine,’ xiv. 16.

† ‘Transactions of Entomological Society of London,’ 1882, p. 503.

the tissues of the scales, and so produce an actual modification of their structure, enabling them to absorb and reflect to us certain rays.

“VIII. And lastly, the same author suggests—but only to dismiss the idea as ‘*probably incorrect*’—‘That blackness arises from the invigorating energy derived from warmth, as blackness absorbs heat rays; but [he adds] in that case it would not properly be a protective colour, but an incident in another line of evolution.’” *

These theories are then examined, with a view to ascertain how far they can be made to account for that particular tendency to melanism under consideration.

It will be seen from the following quotation that the topomorphic variation of such a lepidopteron as *Gnophos obscuraria* is admitted, irrespective of either altitude or latitude, and also the archaic derivation of one of the forms, in the cases of horeomorphic or polymorphic variations:—

“First, it would I think be open to some doubt whether the dark varieties of the northern or Alpine regions are indebted to their colouring for any appreciable measure of protection. In the north of Scotland, and perhaps in the Shetland Islands, the black peaty soil and some few dark lichens growing on the rocks might serve to conceal an insect approaching them in tint.

“It has been observed that *Gnophos obscuraria* and other insects vary decidedly in colour according to the nature of the soil on which they occur, but if we admit that this cause may have some influence where peaty soil is found, it could not be held to account for the like inclination in the Alpine insects to assume a partial melanism, although it has been called into requisition to explain the melanochoic race of certain Lepidoptera occurring in the manufacturing districts of this country, to which I shall have occasion again to allude.

“The only other manner in which such protection might be supposed to arise would be perhaps owing to the strong contrast which would exist between the extreme whiteness of snow and the darker appearance of large or small patches of herbage in its immediate proximity, rendering the latter more nearly black to the perception, at least of human sight, than they would actually be if separated from the shining snow.

“It may be admitted that this contrast would render a dark object under such circumstances less visible than a lighter one. But the amount of protection afforded by reason of these special conditions would appear inadequate to account for any strong hereditary tendency to strive to obtain it.

* *Loc. cit.*, p. 517.

"Coming to the question of archaic derivation the researches and experiments of Weismann* and Edwards† may be admitted to have established a well-supported theory that in cases of seasonal dimorphism and polymorphism, one or other of the varieties produced is probably that which has descended through the longest period from an ancestral form. Both these authors have called attention to the fact that there is less disposition to vary in the female sex, and if the females are truly more conservative than the males, we should be inclined to look to the former sex as most likely to indicate the typical coloration of an archaic race.

"Mr. M'Lachlan‡ pictures the survivors of an Arctic fauna moving northward as increasing temperature succeeded the glacial period, a portion of them settling on the tops of high mountains, stragglers reaching the home of their ancestors, and becoming the progenitors of our present Arctic species; but he fails to suggest that the condition of existence in those two distinct settlements being approximately the same, a natural law producing certain forms in the one place might be equally operative to produce them in the other.

"Admitting the extreme value and interest of these researches, and allowing them their due weight in the collection of evidence upon the general subject, we may remark that their authors in no way profess to account for the primary cause of the melanic tendency, except in so far as they would admit it to be traceable to the external influence of climatic conditions. We may yet ask ourselves, What is the exact method by which the pigments are acted upon, and what advantages, if any, do the insects derive from the change?"

On the subject of insular variations it is remarked:—

"Mr. de Vismes Kane, in his address to the Barnsley Naturalists' Society, § on the Variation of European Lepidoptera, properly pointed out that 'all naturalists are agreed that the strongest developed variations are cut off from intercommunication with the rest of their kind by mountains, vast forests, the sea, or other natural barrier.' But although, as he says, 'isolation begets peculiarity,' I am unable to agree that this is the principal cause of the aberrant coloration of the Shetland insects."

Reasons are then given in favour of the hypothesis that the darkened coloration of the Lepidoptera from high latitudes and altitudes is an advantage to them, inasmuch as they are thus

* 'Studies in the Theory of Descent,' vol. i., and Appendix; English edition.

† 'Butterflies of North America,' and 'Canadian Entomologist,' vol. vii. pp. 228—240; vol. ix. pp. 1—10, 51—55, 203—206.

‡ 'Journal of Linnean Society' (Zoology), 1878, xiv. p. 105.

§ 'The Naturalist,' November, 1884, p. 82.

enabled to absorb more heat from the sun's rays, as black is the greatest absorber of heat.

This hypothesis is thus set forth :—

“Seeing that radiation and absorption alike involve motion, which may be taken to be the basis of the theory of photoplastic mechanical action, we must not forget a point strongly urged by Prof. Tyndall, namely, the importance to the organic world of the ultra-violet invisible rays of the spectrum *on account of their chemical energy*.* It has been shown by the same author ‘that the invisible rays of the sun show a preference for black, which diminishes the reflection.’ It is, of course, no new discovery that among colours black is the greatest absorber of heat. In Craven’s ‘Recreations in Shooting,’† the following passage occurs :—‘Colour is well known to influence the rate by which bodies acquire, reflect, or part with heat, and as white is the colour which most readily and perfectly reflects it, and which most difficultly [*sic*] parts with it, so a body clothed with that colour shall retain heat longest, and therefore be better fitted to exist in the coldest latitudes.’ Applying this to the winter plumage of Ptarmigan, he continues, quoting from Daniel (the original passage I have been unable to find):—‘If two animals, one of a black colour and the other white, be placed in a higher temperature than that of their own body, the heat will enter the one that is black with the greatest rapidity, and elevate its temperature considerably above that of the other; but when these animals are placed in a situation the temperature of which is considerably lower than their own, the black animal will give out its heat by radiation to every surrounding object colder than itself, and speedily have its temperature reduced, while the white animal will part with its heat at a much slower rate.’ Birds and animals living ‘through the winter naturally require to *retain* in their bodies a sufficient amount of heat to enable them to maintain their existence with unreduced vitality against the severities of the climate. Insects, on the contrary, require *rapidly to take advantage* of transient gleams of sunshine during the short summer season, and may be content to sink into a dormant condition so soon as they have secured the reproduction of their species; only to be revived in some instances by a return of exceptionally favourable conditions.”

It is then dealt with in a concrete form by the following illustrations :—

“We all know how rapidly the pairing of our Lepidoptera is effected. Edwards gives instances of freshly developed males gathering round a female pupa to await the emergence of the perfect insect, and the method

* ‘Fragments of Science,’ Tyndall, vol. i. p. 32.

† ‘Recreations in Shooting,’ Craven, 1847, p. 101.

adopted by many collectors of attracting males by the exposure of a newly-emerged female is usually productive of a series of the finest specimens.

"I have myself observed in the case of *Acidalia rubricata*, on a warm evening in August, the extreme rapidity with which the males appear to be developed, and how immediately they hurry to pay their attentions to the scarcer and less active females which cling to the grasses and occasionally rise to meet them in their flight. I can scarcely imagine a colour better suited for rapid absorption of heat, with the exception of black, than the beautiful dark red of fresh specimens of this insect, unless it be perhaps the brilliant green of the under side of *Thecla rubi*. Applying this to the more or less melanic varieties of high latitudes, I think we have a sufficient explanation of the process of selection by which these varieties are established and continued under the influence of a climate essentially unfavourable to the paler forms. Those males whose colour enabled them to absorb the heat most rapidly would naturally be the first to harden their wings and to acquire a degree of vitality sufficient to enable them to commence their flight. If we imagine the emergence of a pale and a dark variety side by side at the same moment, it is more than probable that the paler specimen would remain inactive among the herbage, when his darker companion had already commenced his flight. In unfavourable weather the degree of warmth sufficient to arouse even the darkest varieties might be of very short duration, and if this were so the less favoured males might be wholly deprived of the degree of energy necessary to enable them to find their females. The shorter the continuance of passing gleams of sunshine, the greater would be the influence brought to bear against them; and each separate instance, however unfrequent such instances might be, in which they were thus placed at a disadvantage, would have its effect in diminishing their numbers, promoting the survival of only the fittest forms. If this is so it is sufficiently obvious that the first males on the wing have the best chance of transmitting their colour by an hereditary process to the succeeding generation; and if these males were always or usually the darkest of the brood, their progeny would also be for the most part dark."

To ascertain whether it was a fact that a black or dark insect would absorb more heat than a light-coloured one, the following most interesting and conclusive experiments were made:—

"To set this doubt at rest, I took advantage of the few sunny days during the last fall of snow, with a view to test the comparative rapidity of heat-absorption in some of our common Lepidoptera. On the 23rd of January, at 11.30 a.m., I placed two specimens of *Tanagra charophyllata*, a black insect from the Yorkshire moorlands, and three of *Acidalia immutata*, a white insect from the Norfolk fens, on a smooth surface of snow exposed to bright sunshine at an angle of about 45°; with them I put a

male of *Colias edusa*, a pair of *Satyrus tithonus*, a pair of *Thecla quercus*, and three specimens of *Lithosia stramineola*. A thermometer lying on the grass by the side of the snow stood at 48° Fahr. At noon *Chærophyllata* already showed decided signs of melting the snow, so did *Satyrus* and the female *Thecla*; the black edge of *Colias*, which did not lie very flat upon the surface, had also made a slight impression; the others had made none. At 12.30 the same three continued to increase their impression; the others still made none.

"I then placed a piece of black and a piece of white cloth in the same position. At 1 p.m. the mercury stood at 52°, and the effect produced by the darker insects was still more decided. But although the pale ones remained upon the surface they did not appear to protect the underlying snow from the heat-rays to the same degree as did the white cloth, which remained on a slight eminence as the sun thawed the snow around it. The nearest approach to this protection was evidently accorded by the white *Acidalia immutata*. At 1.30 *Chærophyllata* and the black cloth continued to sink, and the male of *Thecla quercus* was apparently giving off as much heat below it as the female, but not being set with the wings equally flat had not shown the effect so soon. The *Lithosiæ* had by this time also had a very slight effect upon the snow, but not so much as any of the darker insects, and *Chærophyllata* had decidedly won the downward race among them."

The address consists of twenty-eight pages, and is replete with interest and instruction. There are many collateral points adverted to,—among them that in the Lepidoptera, as stated in the fourth quotation, there is less disposition to vary in the female sex. This is quite in accordance with what may be observed in cases where the female retains the normal coloration of a group, and the male departs widely from it—e. g., *Spilosoma mendica*, *Ocneria dispar*, *Gnophria quadra*, and others.

The address of Lord Walsingham is a most valuable addition to philosophical entomological literature. It will incite the young to a higher class of Natural History studies, and is full of information to those older naturalists who have long pursued this delightful branch of Science.

J. JENNER WEIR.

EPPING FOREST DURING 1884.

BY W. H. WRIGHT.

THE long-wished-for sunny summer has passed, and it remains to be proved whether the prognostications of those seers who prophesied that with the return of warm summers a corresponding influence will be exerted upon Lepidoptera, and put an end for a time to the scarcity of insects of that order, which has generally prevailed in these islands during the last three wet years. There is but little doubt that abundant sunshine is necessary to the well-being of most forms of life, and especially to vegetable growths, and, as a natural consequence, to such forms of life as owe their existence to the vegetable world. It would therefore seem to follow that weather which is favourable to the growth of vegetation should likewise be favourable to the insects feeding upon it. And yet there is some room for doubt, for during 1883 and 1884 the trees were more fully foliated than in 1882, especially such as the oak and beech, but without that corresponding increase in the numbers of arboriferous-feeding larvæ which one might expect. Possibly the mild winters of 1882-3, 1883-4, while favouring the growth of trees, may yet have been unfavourable for the hibernating larvæ and ova of Lepidoptera, so that if that is the case we may infer that cold and frost are necessary to the well-being of Lepidoptera in their various stages during the winter months. Of course the character of the spring months must be taken into serious consideration, as we have abundance of proof that a fitful spring, with alternations of frost and mild weather, is fatal to young larvæ.

We are then led to the conclusion that a regular spring, even with low temperature, is more conducive to the well-being of the young larvæ than a fitful one, and a spring of cold sunshiny weather, such as that of the past year, must be the precursor of returning plenty for insect collectors. Such was my anticipation in the early part of 1884, and such was fairly realized, for larvæ were decidedly more plentiful than I have observed them during the three previous years. In some instances I found, however, to my disappointment, that several species had entirely disappeared from their old habitats, among which were *Thecla quercus* and

T. betulæ, from the vicinity of Chingford, and *Sphinx cassinea*, from near Theydon Bois.

My earliest expedition was during the second week in May, when I found many larvæ of *Hybernina leucophearia*, fastening together the leaves of young plane trees. Also others of the same genus, viz., *H. aurantiaria* and *P. defoliaria*, on oak and hornbeam in large numbers. I also noticed that some trees were almost defoliated by that little pest to the larvæ-beater, *Cheimatobia brumata*, and its enemy *Calymnia trapezina*. Towards the end of the month the larvæ of many common species were very frequent, especially on the oak, to which trees I almost confined my attention. More than ordinarily prominent amongst them was *Phigalia pedaria* (*pilosaria*), which in point of numbers was equalled only by *Himera pennaria*. Several *Dicycla oo* and many *Scopelosoma satellitia*, besides those of Tortrices and Tineæ, fell to my tray; while an occasional beat at the whitethorn brought to view *Myselia oxycanthæ*, *Porthesia auriflua*, *Nola cucullatella*, *Diloba cæruleocephala*, more *H. pennaria* and *H. rupicaprararia*, and from the honeysuckle larvæ of *Uropteryx sambucaria* in plenty. *Phorodesma pustulata* (*bajularia*) must also have been fairly common, judging from the numbers of imagines which appeared subsequently, but being a high and concealed feeder I did not see it. Throughout the whole extent of the Forest at this time the larva of *Pseudoterpna pruinata* (*cytisaria*) was taken in large numbers on its usual food-plant, *Genista anglica*, which plant was more than ordinarily conspicuous, on account of its luxuriant growth. Also *Chesias rufata* (*obliquaria*) and *C. spartiata* were taken in numbers on that part of the Forest near Wanstead.

In the early part of June, upon penetrating further into the Forest, towards Theydon Bois, I found that species of Lepidopterous larvæ were plentiful, but much the same as those above enumerated, except Tortrices, with many of which I was not acquainted. A fair amount of work at the oaks brought down several *T. quercus*, *Pæcilocampa populi*, *Asphalia diluta*, and *Hylophila bicolorana* (*quercana*), and a perfect plethora of the pretty larva of *Oporabia dilutata*, and on the wild rose an occasional *Anticlea badiata* and *A. nigrofasciaria* (*derivata*), and on the crab-tree flowers *Eupithecia rectangulata*, although this was rather late for the latter species. I heard also that

Acrolepia betulella was taken from the birch somewhere about this time.

As the autumn drew on, such larvæ as are generally found in the Forest were fairly plentiful, and in some cases numerous, notably in that of *Platypteryx binaria* (*hamula*) from oak, it being a common experience during the end of September and beginning of October for collectors to take several dozen on each visit. Also of the same genus, *P. cultraria* (*unguicula*) from the beeches, *P. falcataria* and *P. lacertinaria* (*lacertula*) from birch. Among those which can be classed as numerous were *Dasychira pudibunda*, *Ephyra trilinearis*, *Eurymene dolobraria*, *Boarmia abietaria*, *H. prasinana*, *H. bicolorana* (*quercana*), *Lophopteryx camelina*; and, in a lesser degree, *Numeria pulveraria*, *Iodis lactearia*, *Demas coryli*, *Hemithea strigata* (*thymiaria*), and many others.

It will thus be seen that, as far as the larvæ of common species are concerned, a brighter future may be looked for, and if the past year has been propitious to the growth of common species, we may look forward to a like effect upon the rarer.

As regards the perfect state of Lepidoptera, my experience of the Forest was not so bright; this was probably due to the effects of the previous year, although as regards such species as usually appear at the end of spring I did not notice any great falling off; in fact several species were unusually abundant, to instance which I may mention *Argynnis euphrosyne*, *Nisoniades tages*, *Syricthus alveolus*, *Melanthia bicolorata* (*rubiginata*), *Cidaria fulvata*, *Melanippe sociata* (*subtristata*), *Angerona prunaria*, *N. pulveraria*, *Procris statices*, *Noctua festiva*, *Euclidia mi*, *Aplecta nebulosa*, and later on *Charæas graminis*. In lesser numbers, *A. selene*, *Lycæna argiolus*, *Odontopera bidentata* and *P. pustulata* (*bajularia*), and as the season advanced *Pericallia syringaria*, *Plusia iota*, and several fairly good species. *Emmelesia decolorata* and *Stauropus fagi* also fell to my lot during the season; and although I was prevented by circumstances from collecting as much as I should wish, yet I found species certainly more abundant than in the two preceding seasons, and I confidently look forward to a much better one during this coming year; and if there is anything in the theory of increased sunshine, we may look forward to filling some of the blanks in our cabinets.

ORIENTAL ENTOMOLOGY.

BY THE REV. F. A. WALKER, D.D.

(Concluded from p. 41).

NEUROPTERA, understanding by this term all species belonging to the tribe, according to the Linnean application, are only scantily represented as a rule, so far as my own observation goes, in the regions of the East. For example, in my tour of 1882, I only came across four species of dragonflies, and three of these were common English ones, two of them, viz., *Libellula depressa* and *Calepteryx virgo*, skimming around the luxuriant vegetation on the banks of the River Meles (a short distance above the grotto of its nymph, and where she is reported, according to popular tradition, to have nursed the poet Homer) on May 8th. The same two species were also noticed at a later date, namely May 25th, about the wooded and stream-fed lawns adjoining the great bend or reservoir of Sultan Selim in the vicinity of the village and forest of Belgrade; while the third and commonest kind was *Sympetrum striolatum*, likewise seen at Belgrade, and so plentiful at home, more especially on heath or common in the autumn. The fourth one, also occurring at Belgrade, was *Crocothemis erythræa*, of the same shape and size as *L. striolata*, but clearly to be distinguished by its bright red body from the tawny colour of the latter. During my second expedition I have also only the occurrence of four species to report in the months of November and December, 1883, as follows:—*Libellula striolata*, *Trithemis rubrinervis*, and *Crocothemis erythræa*, and all at Villa Ciccolani public gardens, Cairo, Island of Roda, and Matareeyeh Gardens, Heliopolis.

Trithemis rubrinervis is not so common as the two other species, and, though nearly of the same size and form, has its body, if anything, more tapering in shape, is a singularly handsome kind, crimson or magenta coloured, with a blue-purple stripe down each side. I first saw it on the Island of Roda, and afterwards in the gardens of the Villa Ciccolani, as good localities as any I know of in Egypt for the capture of Neuroptera. The fourth, I regret to say, I was unable to obtain, and am therefore ignorant of its name. It usually flew very rapidly and high overhead backwards and forwards, while I was forcing my way

through the tall flags and thick underwood which fringes a portion of the island of Roda for the chance of a cast of the net. The colour of the body was lavender-blue, like that of the male of *L. depressa*, but in size it exceeded *Æschna grandis* or *Anax imperator*, and was the largest species of any *Neuroptera* that I have ever seen alive.

My visit to Athens and its neighbourhood in the latter end of May and beginning of June, 1882, must also be mentioned, as I then captured two species of *Neuroptera*, differing from dragonflies, being either the perfect insects of the ant-lion, or else allied to these last. The smaller and by far the commoner of the two had brown-spotted and gauzy fore wings, and the hinder wings much elongated and very slender, in the shape of tails. It abounded everywhere, in the pass of Daphne, the Stadium, Mount Lycabettus, &c., and was especially plentiful on the hill of the Acropolis, in the immediate vicinity of the Parthenon, where the grass was alive with its numbers. Its name is *Nemoptera coa*. I find the nomenclature of the *Neuroptera* in the National Collection very defective and unsatisfactory for anyone, like myself, wishing to compare and name specimens. *Palpares libelluloides* is a rarer and much larger insect. I captured it in the pass of Daphne, and on the hill-side near the Throne of Xerxes. Its name, *libelluloides*, is, of course, to be attributed to the fact that in the wide spread of its wings and brown spots upon them it resembles some of the *Libellulidæ*, *Libellula quadrimaculata* in particular.

I obtained a single specimen of a third kind, *viz.*, *Myrmeleon sævus*, in the vicinity of Belgrade. This last bears a superficial resemblance to the genus *Agrion*. All these perfect insects of the ant-lion, or those akin to them, have a slow, feeble, and wavering flight.

The rare occurrence of brooks and streams, and likewise the fact that so few of the winter torrents are perennial in their flow, may possibly serve to account, to some extent, for the paucity of species of *Neuroptera* so noticeable in the East.

Among *Hymenoptera* may be mentioned a well-known continental species, *Xylocopa violacea*, from the Pass of Daphne, in May, 1882, and two kinds of hornets; the one, our own *Vespa crabro* from the tombs of the Maccabees, in March, and also occurring at Ephesus, Philadelphia, and the River Meles, in

the month of May, 1882; the other is *Vespa orientalis*, resembling our English one in colour and markings, but more elegant in shape. This last one was swarming in December, 1883, in and about Cairo and Heliopolis, being more particularly abundant on the high mud-built walls in the vicinity of the Boulak Museum and the Ostrich Farm; and likewise found at Helwan, Lycopolis, and on the roof of the Temple of Isis at Denderah, in which last place it was seemingly engaged in attacking the clay-built cells of another species of hymenopterous insect, a small rust-coloured bee, *Chalicodoma sicula*, of which there are specimens from Sicily and Algiers in the National Collection. *Chrysis nobilis* is a small bee with blue metallic body, very much like a bluebottle in size and general appearance, frequenting the flowering shrubs in the public gardens at Cairo, in those of the palace of Gezeedeh, and the mimosas bordering the fields in the neighbourhood of Minieh. On referring to my cabinet I find that one specimen is named *Stilbum amethystinum*, and it is possible that, on closer examination, I may discover that I have both kinds, as this last named and *Chrysis nobilis* are nearly allied species, and of similar appearance.

Among the wasps may be noticed two black-bodied species, *Eumenes hottentotta*, from Cairo, and the larger *E. tinctor* from a field to the south of Minieh; both caught in the month of December, 1883. I have a third species (probably a *Eumenes* also) from the banks of the Pharpar, in April, 1882, whence I also obtained a species of *Mutilla*, or winged ant (thorax rust-coloured, body black, with pale yellow spots). Lastly, I have a small portion of a tree-wasp's nest that I found on a shrub alongside the high-road between Mersina and Tarsus, on the 29th of April. Judging from the size of the cells it can only have been constructed by a small species.

Of Diptera I secured five species: two from the neighbourhood of Athens,—one *Dasypogon punctatus* on the hill of Colonos, on June 9th, and the other, another kind of *Dasypogon*, from the Stadium, at the end of May; the third and fourth are respectively a species of *Tabanus*, or horse-fly, from the plain of the Litany, in April, and *Laphria atra*, Ephesus, in May; the fifth, likewise from Ephesus, is as yet unnamed.

Of Hemiptera I collected eight species, of which the five that I succeeded in naming, and two of the unnamed also, are all red,

or reddish, with black patterns on their wing-cases:—1, *Lygæus militaris* widely distributed, as collected at Aceldama and the Valley of Jehoshaphat, Mount Pagus, the Pnyx, the Acropolis, and Deceleia; 2, *Strachia picta*, from the Stadium and Throne of Xerxes; 3, *Pyrrhocoris ægyptius*, from flowers close to Sardis railway-station, and also from Mount Pagus; 4, *Odon-toscelis fuliginosis*, also from Sardis; 5, a species of *Rhaphigaster* from Ephesus; 6 and 7 were collected on the summit of Boulgourloo; and 8 is one of the *Hydrometridæ* from Beyrout.

Homoptera are solely represented by one kind, *Triecphora sanguinolenta* from Aceldama, in April; Ephesus, in May.

ON THE GENUS *AGROTIS*.

BY J. TUTT.

CAN any of our older entomologists give me any decided information pointing to the conclusion that *Agrotis tritici*, *A. aquilina*, and *A. obelisca* are only forms of one and the same species? I remember some time ago reading an article on the subject, but forget on what facts the conclusion arrived at (if any) were based, and I cannot now find the article referred to. I believe some of our leading entomologists treat *A. aquilina* as a variety, but consider *A. obelisca* as specifically distinct. My own experience would point to the conclusion of all three being the same species. I took, during the first fortnight of August, in the neighbourhood of Deal, some 400 *Agrotis tritici*, of every possible form. Certainly I took fifty distinct forms, from a pure pale gray, with faint reticulations and the ordinary discoidal spots of the same colour, to very dark specimens, some of which are beautifully tinged with red, the others being of every intermediate shade. Among these were five or six specimens of the ordinary pale brown form known as *A. aquilina*, and four other undoubted southern *A. obelisca*. Fortunately, I have been able to compare the latter with Scotch specimens which have been sent to me by Mr. Buglass, of Ayton, Berwickshire, and I have no doubt they are really *obelisca*. Of course the fact of taking the species together proves nothing, but I believe I have every gradation of form leading up from the typical *A. tritici* on the

one hand, to *A. aquilina* and *A. obelisca* on the other, and this, I think, points to the conclusion of a common origin of these species, *aquilina* and *obelisca* being two divergent forms of *Agrotis tritici*. I believe, in some northern localities, *A. obelisca* is taken without *A. tritici*, but this might be only a case of the adaptation of this particular form to a certain district, as is the case with the different forms of *Gnophia obscuraria* and *Boarmia repandata*. In the south, I believe every locality that produces *A. obelisca* or *A. aquilina* also produces *A. tritici*, while a few places, of which Deal is one, produces all three forms. The insect taken in Ireland under the name of *aquilina* is much less distinct than many of our own well-marked forms, and would I think at once be referred by entomologists who know *A. tritici* in the South of England rather to that species than to *A. aquilina*. I have been unable to get Irish *A. obelisca*, but understand from a valued correspondent on the west coast, that, although he believes *A. obelisca* occurs there, he is unable to distinguish them; and although I have received a large number of good forms of *A. tritici*, I have never got one at all approaching *A. obelisca*. These three so-called species seem to be rather mixed up; but until some very strong proof is urged in favour of their being distinct, I shall look upon them simply as forms of one and the same species, of which *A. tritici* is the type, and *A. aquilina* and *A. obelisca* divergent forms.

Before concluding this note, I should like to add that I took some very extreme and beautiful forms of *A. cursoria*, some of them closely resembling the Shetland forms. *A. valligera* (which occurred abundantly) also varied very much, two or three specimens being pale and almost devoid of markings, while a few were intensely dark. *A. puta*, *A. suffusa*, and *A. nigricans* swarmed. The latter is a very distinct though variable species, and it seems rather out of place in our lists, between the closely allied *A. cursoria* and *A. tritici*, which in the pale forms seem to hug one another very closely. I was also fortunate in securing a fine male specimen of *A. lunigera*, which I believe is new to the Deal district.

Another important fact I think worth record is, that out of some hundreds of specimens of this genus captured there seemed to be an almost total absence of forms of a brown colour; pale grey forms and very dark (almost black) forms

occurred frequently, with intermediate shades of grey marked with black, but scarcely a specimen of a warm brownish colour. The insects show remarkably against Irish specimens from the west coast, where brown is the prevailing colour in the genus. To those who take these species in the South of England, Irish specimens are a splendid addition, and afford room for good and valuable study.

I think if some of our older and more experienced entomologists would give us information from the great stock of knowledge they possess, many of the difficulties by which comparative beginners are beset might be cleared up. If any gentlemen can give positive information on the correctness or incorrectness of my conclusion, I think many entomologists who are really working for scientific purposes, and to whom the mere collecting is not everything, would, like myself, thank them most heartily.

Yet another query respecting the genus. Can anyone tell me whether *Agrotis pyrophila* occurs now in Great Britain? If so, in what counties or county? And does it occur regularly or periodically? Information will be thankfully received on my part.

Beaconsfield Terrace, E. Greenwich, S.E., Feb. 28th, 1885.

LARVÆ OF BRITISH PTEROPHORI.

BY RICHARD SOUTH.

MAY I again venture to ask the assistance of entomologists to enable me to continue the life-histories of our plume-moths? I append a list of the species I still require, and shall be very thankful for one or two larvæ of either of the species. If desired, I will gladly return to the sender any insects bred from larvæ sent for figuring and description.

Cnæmidophorus rhododactylus. — Larva, end of May and beginning of June on dog-rose. Feeds on the buds, concealing itself by drawing a leaf to the bud by silken threads. While in North Devon I received two larvæ of this species from Mr. Carrington. One of them was in a moribund condition, but the other appeared healthy, and I took down a full description, from which I make the following extract:—Ground colour yellowish

green, dorsal line reddish-violet, narrow on the 11th, 12th, and 13th segments, but swelling out into a stripe on the 2nd to 6th segments inclusive. The larva failed to pupate, and I am still wanting figure and description of the pupa. Strange to say, *C. rhododactylus* seems to have disappeared from its well-known locality in Kent, and I have not been able to meet with it in a less-known locality in Middlesex since 1878. As I remarked in a former paper this insect will probably be found in other places where dog-rose abounds. It is more likely to be met with in the larval stage, by those who will seek it at the time and in the situation referred to above. The imago is rather sluggish, and does not often fly in the daytime. It has been taken at light.

Platyptilia bertrami, Rössl.—Larva, end of May and beginning of June, on yarrow (*Achillea*), eating young shoots, and slightly excavating the young stems. I took about a dozen imagines of this species at Mill Hill last July, on a railway-bank, and shall endeavour to find the larva there this year.

P. isodactylus.—According to Mr. C. G. Barrett this species is double-brooded. Larva, May and August, mining shoots of a marsh species of ragwort (*Senecio aquaticus*). As Mr. Barrett's very lucid and complete account of the habits of this larva is accompanied by a description of the larva itself from the pen of the late Mr. Buckler, my wish to re-describe it may appear superfluous, not to say egotistical. I may say in justification that in this instance, as in all others where a plume larva has already been described, I am only induced to re-describe that the descriptions may be formed on a fairly uniform plan, and in this way facilitate comparison. The addition of figures illustrating mode of feeding appeal to the eye, and, in conjunction with notes on the same subject, enable the "larva-hunter" to engage in his work with some prospect of success.

Amblyptilia acanthodactyla.—Larva, in July, on rest-harrow (*Ononis*), hedge-woundwort (*Stachys sylvatica*), wild basil (*Calamintha clinopodium*), a species of wild mint (*Mentha*), &c.; also in gardens, on geranium and pelargonium. At Ventnor, on August 30th, 1883, I found a number of larvæ feeding on the flowers and unripe seeds of *Stachys sylvatica*. I have descriptions of larva and pupa, but no figures.

A. cosmodactyla (= *punctidactylus*).—Larva, in June and July,
ENTOM.—APRIL, 1885,

on seeds of columbine (*Aquilegia vulgaris*) and meadow crane's-bill (*Geranium pratense*).

Oxyptilus distans.—I do not know anything of the larva of this insect; but Mr. Stainton's note (E. M. M. v. 36) on the economy of a closely-allied species, *O. latus*, Zell., offers a clue for those who have the opportunity to follow it up.

O. pilosellæ and *O. hieracii*.—Larva, in June, on *Hieracium*. Examine the under sides of the leaves.

O. parvidactylus.—Larva, in May, said to feed on thyme and *Hieracium*.

Mimæseoptilus bipunctidactyla.—I am inclined to think that *M. bipunctidactyla* and *plagiodactylus* are only forms of one species. I have a long series of both varieties from various parts of England. Looking at the series of both as a whole, variation as regards intensity of wing-marking and size of individuals is exhibited; but the range of variation, as regards markings and colour, is not so striking as in my series of *P. gonodactylus*, also from various English localities. *M. plagiodactylus* I have bred from larvæ feeding on, and partly in, the shoots of *Scabiosa*. These were sent me by Mr. Purdy, of Folkestone. Previous to this Mr. Gregson had been good enough to send me larvæ of *plagiodactylus*, or as he named it, "*scabiodactylus*." In his note accompanying the larvæ, Mr. Gregson wrote, "You will see how distinct it is from *plagiodactylus* of our list, which has a larva having a broad claret dorsal line." The body-colour and ornamentation of Mr. Gregson's larvæ may be briefly described thus:—Whitish green; dorsal stripe reddish-pink (or rose-madder), most distinct on the 9th to 12th segments. Comparing the Folkestone larvæ with the full description taken from those sent me by Mr. Gregson, I found that they agreed in every particular. I admit that the perfect insects bred from Mr. Gregson's larvæ are more strongly marked, and perhaps smaller, than imagines from the Folkestone larvæ; but as the forms are so identical in their early stages I could not agree with Mr. Gregson as to the distinctness of his insect. I may add that I possibly owe it to Mr. Gregson's well-known courtesy that he refrained from referring to this as an additional proof of my inaccurate knowledge of British plume-moths in his somewhat ambiguously worded, but otherwise characteristic article, anent scientific nomenclature, in a recent number of a Natural-History journal.

The following rough description refers to a plume larva I obtained at Brandon, July 3rd, 1882, by sweeping the flower-heads of such plants as *Scabiosa*, *Centaurea*, *Silene*, *Echium*, &c.:—Length 4 lines, tapering slightly posteriorly. Head yellowish, spotted with black; mandibles black. Ground colour dingy green, with a broad purple-madder dorsal stripe edged with yellowish, rather narrower on 2nd to 4th segments inclusive; 2nd segment yellowish, with six black dots. Prolegs and anal claspers black.

The above portrait was drawn in the field. The larva was placed in a small tin box, with flower-heads of the various plants named above; but owing to a pressure of work I failed to look into the box again until July 24th, when I found a fine but defunct *plagiodactylus*. I should state that I was not ostensibly sweeping for larvæ when I “fluked” the plume larva referred to; I was, in fact, stalking a wary specimen of *Agrophila trabealis*, Scop. (= *sulphuralis*, L.), at the time. The moth was observed to settle among a patch of *Echium*; but when I arrived on the spot I could not see *trabealis*, so I gently passed the net to and fro over the heads of the surrounding herbage, with the result of capturing the fugitive moth, and the larva of *plagiodactylus* also.

M. zophodactylus, Dup. (= *loewii*, Zell.)—Larva, in August and early September; flowers of common centaury (*Erythræa centaurium*). I have a description of the larva, taken from a solitary example in 1881. Ground colour yellowish green, with a broadish violet dorsal stripe from the 3rd to 13th segments inclusive.

Pterophorus monodactylus, L. (= *pterodactyla*, Hb., Haw.)—Larva, in August; flowers of convolvulus, both wild and garden.

Leioptilus osteodactylus.—Larva, in September and October; flowers and seeds of golden-rod (*Solidago virgaurea*), yarrow (*Achillea millefolium*), and mugwort (*Artemisia vulgaris*). Hibernates and pupates in the spring.

Acipitilia tetradactyla.—Larva, said to occur in May and June, on thyme. I have expended many hours in vain searching for the larva of this species.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*),CHAROPS, *Holmgr.*

Middle of abdomen red ; front legs reddish, base black.

1. *decipiens*, 5 lines.

This species is much like *Campoplex pugillator*, but with no areolet in the front wings. It appears to be rare. According to Giraud it is parasitic on *Zygæna filipendulæ*, and has been bred by Perris from *Botrys lupulinalis*.

Since the publication of the generic table of the Ophionidæ, another of Förster's genera has been detected in this country. This will necessitate a slight alteration. In Section II., Division I., Subdivision 1, after *B.* must be added :—

† Eyes hairy.

! Wings without an areolet ; post-petiole with a transverse depression.

Thymaris.!! Wings with an areolet. - - - - - *Cymodusa.*THYMARIS, *Först.*

2nd and 3rd segments of abdomen red-banded, 4th obscurely so ; front legs pale red, base black, hind legs black, middle of tibiæ red.

fasciatus, 3½ lines.

This very distinct subdivision of *Cymodusa* has been added on the strength of a male specimen captured in Norfolk by Mr. Thouless, in 1884. Förster, as was so often his custom, described no species of the genus he created. Brischke described *T. pulchricornis* in the Danzig. 'Schriften' (vol. v., pt. 1, p. 38), but that is very distinct from the one now under consideration.

CYMODUSA, *Holmgr.*

A. Abdomen black (male).

Front legs and apex of hind trochanters yellow, middle of hind tibiæ yellowish red. - - - - - *flavipes*, 3 lines.

B. Middle of abdomen more or less red ; legs red, coxæ and base of trochanters black, tarsi fuscous ; aculeus about as long as the 1st segment (males and females).

- a. Antennæ of female white-marked towards the base; supero-medial area of metathorax wider than long. - 1. *leucocera*, 3 lines.
 b. Antennæ not white-marked; supero-medial area not shorter than wide. - - - - - 2. *cruentata*, 3 lines.

The species of this genus, so like *Limneria*, are easily distinguished by the eyes being rather densely clothed with short stiff pubescence. *C. flavipes*, Brischke, is added to the British list at Trans. Ent. Soc. Lond., 1882, p. 149. *C. cruentata* has been bred by Mr. Bignell from *Anisopteryx æscularia*. Brischke bred his *C. elachistæ* from an *Elachista*, which mined the leaves of *Phleum pratense*.

SAGARITIS, Holmgr.

- A. Abdomen black (males and females).
 a. Post-petiole with three pits; 2nd abdominal segment transversely impressed.
 Femora, tibiæ and tarsi greater part red; aculeus half the length of 1st segment. - - - - - *incisa*, 2½ lines.
 b. Post-petiole with no pits.
 * Hind tibiæ black- or fuscous-marked.
 Hind legs greater part black; middle of tibiæ and base of tarsi whitish; aculeus longer than 1st segment. *laticollis*, 2—2½ lines.
 ** Hind tibiæ entirely red and yellow.
 Black; legs red, coxæ and base of trochanters black, middle of hind tibiæ yellow; aculeus as long as 1st segment. *postica*, 3½ lines.
 B. Abdomen more or less red (males and females).
 a. Intermediate segments generally more or less red-margined; sides sometimes red; abdomen sometimes almost or quite black.
 * Middle and hind femora black; aculeus long.
 1. *declinator*, 3—4 lines.
 ** Femora red, base and apex of hind one sometimes almost entirely dark.
 † Recurrent nervure received before the middle of the areolet; aculeus as long as petiole of abdomen. - 2. *zonata*, 2—3½ lines.
 †† Recurrent nervure received in or behind the middle of the areolet; aculeus longer than petiole of abdomen. 2. *latrator*, 2—3½ lines.
 b. Middle of abdomen and legs red; coxæ and base of hind trochanters black, hind tarsi piceous; aculeus shorter than the 1st segment.
raptor, 3½ lines.

This genus is easily distinguished by the horn- or tooth-like termination of the clypeus. Holmgren describes seven species in his 'Monographia'; Tschek includes ten and *S. ebeninus*, Gr., in his 'Die Österreichischen Sagaritis-arten' (Verh. z.-b. Gesell. Wien, xxi., pp. 45–53). We are convinced there are several species mixed up in *S. zonata* and *S. latrator*. Gravenhorst says the aculeus of *latrator* (which he describes as one-fourth the

length of the abdomen) is longer than *zonata* (which he describes as one-fifth the length of the abdomen); but he adds a variety of *zonata*, of which he says, "aculeus longitudine quartæ aut quintæ partis abdominis," which thus connects the two; the coloration of the abdomen and legs also varies greatly. None of our specimens quadrate exactly with any of Tschek's four species, so we follow Holmgren, and keep them together until more bred specimens come into our possession; even the neururation and areæ of metathorax, which Tschek uses for his distinguishing characters, do not appear to be constant. We have included Tschek's distinctions between the two species, but do not consider them satisfactory. The cocoons appear to offer a much more appreciable character than the imagos. We know four distinct forms of *S. zonata*:—(1) Cylindrical ($3\frac{1}{2}$ by $1\frac{1}{4}$ lines), hard, pearly white, semitransparent, without markings, except a narrow opaque white central band, surrounded by a few slight silky white hairs, ex *Cheimatobia brumata*. (2) Pale yellowish white, subopaque, without markings; bred by Mr. Bignell, ex *Hecatera serena* (? *latrator*), figured on plate ii., fig. 2. (3) Opaque white, with faint black zonal markings; bred by Mr. W. H. B. Fletcher, but host uncertain (? *maculipes*). (4) Deep brown, rather rough, without markings, ex *Eubolia cervinaria* (? *zonata*, male); resembles the cocoon of *S. incisa*, but is rather narrower and paler. The cocoon of *S. declinator* is cylindrical ($3\frac{1}{4}$ by $1\frac{3}{4}$ lines), brown, without markings. That of *S. laticollis* rather smaller (3 by $1\frac{1}{8}$ lines), brown, reticulated with black; this stronger towards base and apex, surrounded by brown flossy silk, ex not half-grown larva of *M. typica* found feeding on fuchsia by Mr. P. Inchbald, in the People's Park, Hull. The cylindrical (3 by $1\frac{1}{4}$ lines), wrinkled, leathery, unicolorous olive-brown cocoon of *S. incisa* is figured on plate ii., fig. 12. Brischke describes the cocoon of *S. raptor* as cylindrical, hard, dirty white, with two zones consisting of black spots, and the poles strewn over with such spots and dots, ex *Orgyia antiqua*; of *S. cognata*, Tschek.?, he says, "cocoon cylindrical, unicolorous pale brown, from a young *Noctua* larva." To the two species in Marshall's catalogue we can add *S. raptor*, Zett., *S. incisa*, Bridgm. (Trans. Ent. Soc. Lond., 1883, p. 165), also *S. laticollis*, Holmgr. (in Mr. Marshall's collection from Bishop's Teignton and Abergavenny), and *S. postica*, Bridgm., a new species.

The following species have been bred :—

1. *declinator*, *Gr.*, from uncertain host. Bignell, 25th March.
zonata group, from *Cheimatobia brumata*; Bignell. *Eubolia cervinaria*;
 Cross. *Hecatera serena*; Bignell. *Coleophora therinella*; Fletcher.
raptor, *Zett.*, from *Orgyia antiqua*, *Eupithecia campanulata*, *E. sobri-*
nata; Brischke.
laticollis, *Holmgr.*, from *Mania typica*; Bignell.
incisa, *Bridgm.*, from *Anisopteryx æscularia*; Norgate.
 Kriechbaumer bred a species from *Grammodes Algira*.*

CASINARIA, *Holmgr.*

- A. Apex of abdomen not compressed at the sides (males and females).
 Abdomen black.
 - a. Scape of antennæ pale beneath.
 Orbits yellowish white; legs red, coxæ and trochanters black, hind
 tibæ and tarsi white and black variegated.
 1. *orbitalis*, $2\frac{1}{2}$ —3 lines.
 - b. Scape of antennæ entirely black.
 Legs red, coxæ and trochanters blackish, front ones sometimes
 entirely or apex yellowish, tarsi and hind tibæ black, the latter
 in the middle, outside and extreme base whitish or reddish.
 4. *tenuiventris*, 3 lines.
- B. Apex of abdomen more or less compressed at the sides (males and
 females).
 - a. Abdomen black.
 Front legs fulvous, base black, hinder black, middle of tibæ widely
 and base of tarsi beneath whitish. - 3. *vidua*, $2\frac{1}{3}$ — $3\frac{1}{3}$ lines.
 - b. Middle of abdomen red-marked.
 Legs reddish, base black; hind femora brown at apex; hind tibæ,
 apex and before the base, and tarsi pale fuscous.
 2. *mesozosta*, 3—4 lines.

The species of this genus are distinguished from *Limneria* by having the margin of the eyes against the antennæ notched, but this character is slightly noticeable in certain other *Limnerias*. The metathorax is without areæ, the head is transverse, and the aculeus is very short, scarcely exerted. *C. vidua* is included by Holmgren as a true *Campoplex* in his Monograph. He writes:—"The compact hairy covering on the metathorax conceals the spiracles, and this was the reason that I assigned the species to a wrong place at the time of the publication of the 'Monographia Ophionidum Sueciæ.'" Tschek says the spiracles are "kurzspaltformig"; they are not circular. Desvignes' *C. Henaultii* is certainly this species. It is a common parasite of *Abraxas grossulariata*, having been bred therefrom by Bignell (Entom.

xiii. 246), Raynor, Weston, and ourselves; its thick, double-banded cocoon is figured on Plate ii., fig. 11. Of *C. tenuiventris*, Gravenhorst says (I. E. iii. 483) that Nees bred a female from a cocoon with two fasciæ and the base black, it was parasitic on *Amphidasys betularia*; whilst Sturm bred it from a $2\frac{1}{2}$ line long, white, ovate cocoon, spotted with black, and with two black bands (*cingulis*); Bignell has bred it from *Hemithea thymiaria* and *Hybernica progemmaria*; cocoon cylindrical ($3\frac{1}{2}$ by $1\frac{1}{2}$ lines), very compact, brown, two bands base and apex black; Giraud from *Ephyra punctaria* and Brischke from *Eupithecia pimpinellata*. *C. orbitalis* has been bred from young larvæ of *Deilephila galii* and from *Anticlea sinuata* by Brischke; cocoon elliptical, rough, whitish, more or less black-spotted at the poles. He also says that *C. senicula*, Gr., pupates in a similar manner to *C. ebeninus*, under the larva of *Orgyia gonostigma* (see p. 18 ante). Tschek has monographed the Austrian species at Verh. z.-b. Gesell. Wien, xxi., pp. 54-59; he includes eleven.

LIMNERIA, *Holmgr.*

SECTION I.—Fore wings without an areolet.

A. Abdomen black.

A. Scape of antennæ black beneath; aculeus of female about half the length of abdomen.

a. Hind femora red.

* Legs red, coxæ black (females).

† Aculeus half the length of abdomen; trochanters and stigma black. *deficiens*, $4\frac{1}{2}$ — $4\frac{1}{2}$ lines.

†† Aculeus scarcely half of abdomen; trochanters and stigma yellow. *exareolata*, 2— $2\frac{1}{4}$ lines.

** Apex and before the base, or base and apex of hind tibiæ dark (females).

† Aculeus about half of abdomen. - *vestigialis*, $1\frac{1}{2}$ — $1\frac{3}{4}$ line.

†† Aculeus less than half of abdomen. - *exareolata*, var.

b. Hind femora black.

§ Hind legs almost entirely black; aculeus very short (male and female). - *aberrans*, 2 lines.

§§ Hind tibiæ reddish, apex and before the base dark; aculeus about one-sixth of abdomen (male and female). - *Elishæ*, $1\frac{1}{2}$ line.

B. Scape of antennæ pale beneath.

* Scape yellow beneath.

† Hind femora red.

† Hind tibiæ reddish, or sometimes apex and before the base brown.

§ Aculeus one-third of abdomen. - *exareolata*, 2— $2\frac{1}{4}$ lines.

§§ Aculeus very short (female). - *Fitchii*, 3 lines.

†† Hind tibiæ reddish; apex and before the base dark (male). *vestigialis*, $1\frac{1}{2}$ — $1\frac{3}{4}$ line.

- †† Hind femora more or less piceous.
 × Hind tibiæ reddish or reddish straw, base and apex brownish;
 aculeus scarcely half of abdomen. 68. *transfuga*, 1—1½ line.
 ×× Hind tibiæ dark brown, with lighter rings; aculeus two-thirds of
 abdomen (female). - - - 33. *flaviventris*, 2½ lines
 ** Scape reddish beneath.
 → Hind femora red; aculeus scarcely half of abdomen.
 ↔ Front coxæ red (female). - - - 8. *apostata*, 1¾ line.
 ↔↔ Front coxæ black (female). - - 28. *exareolata*, 2—2¼ lines.
 →→ Hind femora black.
 Apex of hind tibiæ reddish; aculeus short (female).
croceipes, 2¾ lines.
 B. Abdomen red and black.
 * Scape black beneath.
 † Hind femora red.
 Middle of abdomen, femora and tibiæ red; apex of latter dark;
 aculeus very short. - - - 4. *alienata*, 3—3¾ lines.
 †† Hind femora dark.
 Sides of abdomen red; hind legs almost entirely black; aculeus
 very short (female). - - - 1. *aberrans*, 3 lines.
 ** Scape pale beneath (males and females).
 † Legs red; 2nd and 3rd segments of abdomen red; aculeus longer
 than the 1st segment. - - - 25. *dorsalis*, 2½ lines.
 †† Hind legs black; 3rd to 7th segments of abdomen red; aculeus
 short. - - - 14. *braccata*, 2¾ lines.

SECTION II.—Fore wings with an areolet.

DIVISION 1.—Back of metathorax more or less concave.

- A. 2nd segment of abdomen hardly longer than wide.
 Black; legs red, coxæ and base of trochanters black; hind tibiæ and tarsi white or whitish; apex and before the base of the former dark, and articulations of the latter dark: aculeus half of abdomen (male and female).
 * Sides of post-petiole subrotund. - - 2. *albida*, 2½—3 lines.
 ** Sides of post-petiole somewhat parallel; hind femora generally dark at the apex. - - 36. *geniculata*, 1½—2¼ lines.
- B. 2nd segment of abdomen distinctly longer than wide.
 Black; legs partly red or pale.
 * Scape of antennæ black beneath.
 † Flagellum of female marked with white in the middle; legs red; base and apex of hind tibiæ and tarsi brown; aculeus very short (female). - - - - *albovineta*, about 2 lines.
 †† Flagellum of female not white-marked; coxæ and hind trochanters black; hind tarsi infuscated; aculeus rather more than half of abdomen (male and female). - 51. *mutabilis*, 2—2¼ lines.
- ** Scape of antennæ pale beneath.
 Legs red, base black, tarsi fuscous; aculeus rather more than half of abdomen (female). - - - 30. *Faunus*, 2¼ lines.

DIVISION 2.—Back of metathorax not, or scarcely, concave.

- A. Abdomen black, or almost so; scape of antennæ black beneath.
 A. Hind femora red.
 a. Hind tibiæ red, or apex fuscous; rarely base also.
 * 3rd segment of abdomen with a chestnut spot at the side; aculeus one-third of abdomen (female). 44. *lateralis*, $2\frac{1}{2}$ lines.
 ** 3rd segment not red-marked.
 † Aculeus about half of abdomen.
 ‡ Transverse anal nervure of hind wing geniculated.
 § Metathoracic areæ obsolete (female). - *robusta*, about 3 lines.
 §§ Metathoracic areæ distinct.
 × 3rd segment of abdomen quadrate (female). 22. *difformis*, about 3 lines.
 ×× 3rd segment of abdomen transverse (female). *ovata*, about 3 lines.
 †† Transverse anal nervure not geniculated.
 o 3rd segment of abdomen quadrate (male and female). 27. *erucator*, about 3 lines.
 oo 3rd segment of abdomen transverse (male and female). *cylindrica*, $1\frac{3}{4}$ lines.
 †† Aculeus not more than one-third of abdomen.
 Metathorax very short.
 ! Aculeus rather longer than 1st segment of abdomen (male and female). - - - *Kriechbaumeri*, $2\frac{1}{2}$ — $3\frac{1}{2}$ lines.
 !! Aculeus shorter than 1st segment. - *vulgaris*, 3— $3\frac{1}{2}$ lines.
 ††† Aculeus very short, hardly exerted.
 + Hind tibiæ white at the base. - - ? *prussica*, $2\frac{1}{4}$ lines.
 +- Hind tibiæ not white at the base.
 ++ Front coxæ yellow, base dark. - - - *Brischkei*, 3 lines.
 +++ All the coxæ black. - - - 42. *insectator*, 2 lines.
 b. Apex and before the base of hind tibiæ dark.
 * Hind tibiæ white.
 † Coxæ black, front ones more or less pale beneath at the apex.
 ‡ Margin of hind segments castaneous; aculeus about one-third of abdomen (female). - - - 73. *viennensis*, $2\frac{1}{2}$ lines.
 †† Margin of hind segments black.
 § 3rd segment of female transverse; aculeus one-third of abdomen. 52. *nana*, $1\frac{1}{2}$ line.
 §§ 3rd segment of female not transverse; aculeus rather less than half of abdomen.
 × Hind femora entirely red. - 18. *cerophaga*, $2\frac{1}{2}$ — $2\frac{3}{4}$ lines.
 ×× Hind femora black at the base. - - ? 11. *arvensis*, 2— $2\frac{1}{2}$ lines.
 †† Front and part of middle coxæ yellow.
 o Aculeus about one-third or one-fourth of abdomen. 67. *tibialis*, $2\frac{1}{2}$ lines.
 oo Aculeus about one-sixth of abdomen.
 ! Post-petiole quadrate; supero-medial area transverse; sides of 2nd and 3rd segments often more or less red. *virginalis*, $2\frac{3}{4}$ lines.
 !! Post-petiole longer than wide; supero-medial area elongate. 37. *gracilis*, $1\frac{3}{4}$ — $2\frac{1}{2}$ lines.
 ** Hind tibiæ reddish.

- Aculeus about as long as the abdomen (female).
66. *sordida*, 2—2½ lines.
- Aculeus about half of abdomen (male and female).
- Aculeus slightly curved upwards.
- ω 2nd segment of female quadrate. - 62. *rufipes*, 2½—3 lines.
- ωω 2nd segment one-third longer than wide. 47. *majalis*, 2—3 lines.
- ωωω 2nd segment twice as long as wide. - 23. *dispar*, 2—2½ lines.
- Aculeus describing half a circle. - - *curvicauda*, 1½ line.
- c. Base and apex of hind tibiæ dark.
- * Aculeus about half of abdomen.
- † Aculeus strongly curved upwards; marks on hind tibiæ faint (male and female). - - 34. *flexicauda*, 1¼—1½ line.
- †† Aculeus slightly curved; marks on hind tibiæ black (male and female).
- ‡ Hind coxæ black. - - - - - *interrupta*, 2 lines.
- ‡‡ Hind coxæ red. - - - - - *coxalis*, 3—3½ lines.
- ** Aculeus one-fourth of abdomen (female). - 58. *parvula*, 2 lines.
- B. Hind femora dark.
- a. Hind tibiæ red.
- Front femora and tibiæ red; aculeus very short (male and female). - - - - - 39. *immolator*, 2½ lines.
- b. Base and apex of hind tibiæ dark.
- * 2nd segment of female transverse; middle of hind tibiæ piceous; aculeus very short (male and female).
- † Hind tibiæ in the middle-outside testaceous.
69. *tristis*, 2½—3 lines.
- †† Hind tibiæ red. - - - - - 39. *immolator*, 2½ lines.
- ** 2nd segment of female not transverse.
- ‡ Aculeus of female very short; head transverse (male and female).
55. *obscura*, 2½ lines.
- ‡† Aculeus of female one-fourth of abdomen (male and female).
57. *Paniscus*, 2½ lines.
- ‡‡† Aculeus of female half of abdomen; head subbuccated (male and female).
- § Margin of 2nd segment castaneous. - 29. *exigua*, 1—1¾ line.
- §§ Margin of 2nd segment not castaneous. - *cursitans*, 1¾ line.
- c. Apex and before the base of hind tibiæ dark.
- * Aculeus about half of abdomen (female). *volubilis*, about 2 lines.
- ** Aculeus a little longer than 1st segment (female).
lugubrina, 1½—2 lines.
- *** Aculeus one-sixth of abdomen (female). - 7. *annulata*, 2½ lines.
- **** Aculeus subexserted (male and female). 3. *albipalpis*, 2¾—3½ lines.
- B. Abdomen black, or almost so; scape of antennæ pale beneath.
- A. Hind femora red; aculeus very short.
- a. Hind tibiæ red, or apex dark.
- * Apex of 1st to 3rd joints of hind tarsi pale (male and female).
65. *sericea*, 2½ lines.
- ** Hind tarsi entirely black (males).
- † Cubito-discoïdal nervure with a nervelet. 53. *nigritarsa*, 2½—3 lines.
- †† Cubito-discoïdal nervure without a nervelet. - ? *clausa*, 3 lines.
- b. Base and apex of hind tibiæ dark; hind femora partly red, generally piceous; aculeus short.
41. *inquinata*, 2—2½ lines, female.

From early spring to latest autumn some representative of the genus may be found. Perhaps the first to be taken is *E. abbreviata*, which occurs at night feeding on the nectar of sallow-bloom, and at rest during the day on the lower boughs of oak trees in woods; a sharp jar from a stout stick will remove them from their resting-place, when females can be taken, and a series reared on oak leaves. From these trees also the larvæ may be beaten during the early summer, being full-fed in the first week of July. It appears to occur everywhere in varying numbers, and should be taken the first season. Although *E. helveticaria* may be counted a rarity, it should be looked for wherever juniper grows freely, on chalk or limestone. In captivity it is one of the first to emerge from pupa, and often comes out as early as the end of January. It is said to fly in May; but it will be well to search for it before that month. The larvæ are full-fed in September, and are to be beaten from juniper in the localities frequented by the species, which are known to be near Edinburgh, Tring, and elsewhere. Perhaps if carefully sought for it could be found in many others.

Eupithecia irriguata may be taken among large oaks about Easter time. The New Forest is the favourite haunt of this species, which has the habit of resting during the daytime on the under sides of the lower boughs, as well as on the tree trunks. If a suitable night could be selected—one without east wind, or any wind in fact—I think light would prove attractive to *E. irriguata*. It is best to obtain a brood of eggs, if possible, and rear them. These larvæ may be “sleeved” on a branch of oak, if opportunity offers, and left to feed themselves. They should be seen from time to time, however, for it is not long since such a brood perished from the too affectionate attentions of a larva of *Calymnia trapezina*, which had hatched out from an egg previously laid upon the enclosed branch. *E. irriguata* is one of the rarer pugs, and is only sparingly found even in the localities frequented by it, which are chiefly old oak woods in the South of England. There is no reason why Sherwood Forest, and likely places further north, should not be explored for it with success. The larva is regularly taken each year in small numbers in June or July in the New Forest by beating oak branches.

Among the spring captures will be *E. indigata*, which one will hardly fail to find in its proper locality—a well-grown fir wood.

It is only necessary to walk through the sad and funereal-looking grove, with a stout stick with which to tap the trees as one passes, and off fly the *indigata*. If larvæ are wanted, and it is worth breeding for it is at best but a shabby-looking species, they may be beaten from fir during July, when they are full-fed. Perhaps larch grows near the firs, when we may expect *E. lariciata*. They also rest on the trunks of the larches in the daytime, but prefer the lower branches. A large spreading tree of this kind will often produce a good series if worked carefully, but the moths require watching, for they possess the habit of dropping straight to the ground, and remaining motionless. I have taken *E. lariciata* from the North of Scotland to the South of England.

By the sides of the woods, when the willow-catkins are just ready to fall, is the time and place to take the larvæ of *E. tenuiata*, which, like several others of the genus, is more easily collected in the larval than the perfect state. It is only necessary to choose a dry day, and beat the catkins on to a sheet or into an umbrella, and keep them in a large flower-pot with a little earth at the bottom, or other place where they will be dry and unlikely to mould. It is useless to look for each larva of *E. tenuiata* separately; but the moths will come out in June, sometimes in surprising numbers, where not a single larva was observed. The moths have been taken in Yorkshire, the fen-lands, and many other localities. Even if not known to occur in a particular locality it is worth while gathering the catkins, for one is sure to breed something from them. The reverse may be said of *E. pumilata*, for it is much more commonly taken as an imago than in the larval state. In April and late into summer, as there are probably a succession of broods, it may be found all over the three kingdoms at rest on palings, trunks of trees, &c., especially about cultivated lands; though in Scotland it occurs freely even on the highest and bleakest moors. It flies during the afternoon sunshine, as well as at dusk of evening. The larvæ feed upon the flower-heads of many compositæ, but singly, and not semi-gregariously, as is the case with some other species of the genus. The habits of *E. satyrata* are much the same as *E. pumilata*, frequenting palings and tree-trunks in the south, but flying freely in the afternoons on the northern moors. This species varies so

greatly according to locality that one is apt, on first seeing it flying plentifully on a Scotch moor, to think we have found something new. No doubt both these latter species feed upon the heather, or ling, in such localities, though some think otherwise. In similar places we find *E. nanata* and *E. minutata*, both flying during the afternoon and evening in early May over heaths. The former wherever the food-plant, heather, occurs, and further north than the latter. Much the best way to obtain a good series of either is to sweep the heather flowers in August and September for the larva, which may be obtained in numbers. That of *E. nanata* is very beautifully marked with pink and white, while the other species is more uniformly coloured. *E. castigata* has the reputation of being one of our commonest moths, but it is more numerous in some localities than others. It occurs singly all over Britain and Ireland, and the larvæ seem to feed singly, and upon almost anything, in July, August, and September. Another, with like habits and time of appearance, is *E. vulgata*. It will be well to rear both these from ova.

Among the late spring-time "pugs" *Eupithecia venosata* is one of the most easily obtained, and certainly one of the prettiest. The imagines are never found far from the food-plants, and flit there-about gently at dusk in May and early June. It occurs in almost every locality where any of the genus *Silene* grows plentifully. Those larvæ which have fed upon *S. maritima* by the sea coast produce generally larger and often darker moths than one breeds from the inland-growing *S. inflator*. It is much better to simply gather the unripe seed-pods in June, July, and even August, put them into a bag about the size of a small pillow-case, tie them up, and leave the larvæ to pupate among the broken leaves, &c. This saves much trouble in looking for individual larvæ. By stretching a hoop within the mouth of the bag, in spring, one can see the moths as they come out. This hoop can be covered with open gauze, a loose place being left for the hand when entering to box the moths as they come out. This feeding of larvæ of *Eupitheciæ* in bags is frequently very successful where the food-plant can be easily gathered in quantities, no earth for the pupæ to change in is needed, and the system is most convenient. The bags are best kept in an outhouse, or other place where not too dry, and the material of which they are made should be fairly open, as to admit of good ventilation, so as to

prevent mouldiness. All gatherings should take place when the food-plant is dry, otherwise the success of the experiment is much endangered.

(To be continued.)

THE GENUS *GONIODOMA*, ZELL.

By GEORGE COVERDALE.

THIS genus, which until lately consisted of a single well-defined species, *G. auroguttella*, F. v. R., has been the subject of considerable discussion, due chiefly to an article, from the pen of Mr. H. T. Stainton, in the Ent. Mo. Mag., vol. xxi., p. 59, "On the *Coleophora* of the *Statice limonium*, hitherto erroneously recorded as *Goniodoma auroguttella*, F. v. R." After giving an account of this curious case of mistaken identity, and of Mr. W. H. B. Fletcher's fortunate discovery of the larva of our species, &c., he writes, "I would propose for it the name of *limoniella*; further, as it would hardly be suitable to place it in the genus *Goniodoma*, its habitation not showing any angles, I would prefer to locate it, for the present, at least, in the genus *Coleophora*, of which we now know several species that bore into stems, such as *C. salicorniæ* and the very handsome South Russian *C. argyrella*, H.S.; hence we cannot look upon that habit as furnishing a sufficient justification for separating individual species from the main genus *Coleophora*." If this view be accepted it means the abolition of the entire genus *Goniodoma*, now comprising three species, in favour of placing these insects with the already perplexing hosts of *Coleophora*; for the imago of *auroguttella* is almost identical in structure with that of *limoniella*, and although I have as yet had no opportunity of examining *millierella*, I believe considerable difficulty is experienced in separating it from *auroguttella*. Probably no one would seriously propose to locate *limoniella* and *millierella* in the genus *Coleophora* on account of their cases, whilst retaining *auroguttella* as the sole exponent of *Goniodoma*. If one is a *Coleophora* they all are; to separate them generically seems impossible. The position assumed by Mr. Stainton in this matter appears to me untenable, and I think there is evidence to

show that, however inappropriate the designation, the genus *Goniodoma* is a good one, and the insects composing it capable of a firm and clear separation from the closely allied *Coleophora*. Indeed, a careful study of the venation in the latter genus would, I am persuaded, show it to be capable of well-defined subdivision.

Last July, at Shoeburyness, I met with *Goniodoma limoniella* flying in the afternoon sunshine amongst *Statice limonium*. This being my first introduction to the species I was much puzzled (believing it to be attached to *Atriplex*) to account for its evident partiality to the *Statice*, although several species of *Atriplex* were growing in the greatest profusion in the locality.

My most striking remembrance of the occurrence was the peculiar manner in which the insect holds its antennæ in repose, —not porrected and nearly parallel as in a true *Coleophora*, but enclosing a considerable angle, at least 45° , and sometimes waving them gently and alternately up and down. When, a few days later, Mr. Stainton's article appeared, I wrote to him stating my recent experience of the species as an argument against the proposed incorporation of the genus with *Coleophora*; he replied that he had not noticed this peculiarity in those which he had bred. Other inquiries which were made convinced me of the accuracy of my observation, which, it is interesting to find strengthened by the latest addition to our knowledge of the habits of *millierella* recorded by Mons. A. Constant from the South of France (Ent. Mo. Mag., vol. xxi., 250, 235). Turning to Fischer von Roeslerstamm's fine 'Abbildungen zur Berichtigung,' &c., we have further evidence in support of my statement. On plate 86 K is a small side view of *aurouguttella* at rest, which shows the antennæ porrected but not parallel. If the insect held them parallel they would both be in the same line, and one only could be seen. Plate 87, A, shows the same thing, B and C being enlarged figures which faithfully represent the position of the antennæ in *limoniella*. We should bear in mind, however, that *Coleophoræ*, with their wings expanded, are generally represented with the antennæ widely separated, but on the whole it seems highly probable that all the species in the genus carry their antennæ in a manner totally different from that as yet recorded of any *Coleophora*, which is of itself significant of a

difference in structure and an argument in favour of retaining the genus *Goniodoma*.

It will now, perhaps, be instructive to glance at Zeller's diagnosis of the two genera in the 'Linnæa Entomologica,' Bd. iv., 191. Beitrag zur Kenntniss der Coleophoren. At page 195 we have the following :—

Coleophora, H. Z. Dup.—Alæ anteriores vel lineatæ. Cellula discoidalis venas 7-8 emittet. Metamorphosis intra saccum.

Goniodoma, m.—Antennæ penicillatæ, flagello nudo. Alæ anteriores (caudate) postice transverse maculatæ. Cellula discoidalis venas 7 emittet. Metamorphosis extra saccum."

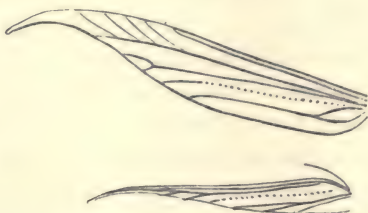
"*Metamorphosis extra saccum*" is now disputed by Mons. A. Constant of millierella, and none of the other terms appear precise enough to separate the genus from *Coleophora*. Some of Zeller's further remarks on the venation I am unable to verify; for example "The median nervure ends unbranched (einfach)," and it therefore appeared advisable to give drawings of the venation, and thus enable others to form an opinion as to the distinctness of the two genera.



COLEOPHORA LINEOLELLA. $\times 4$.

COLEOPHORA LIXELLA. $\times 4$.

The venation exhibited by *Coleophora lineolella* seems to be the prevailing type of the genus, with the fore wings comparatively short and broad. *Coleophora lixella* has the fore wings caudate, the closed discoidal cell much attenuated towards the base, and the 4th subcostal nervule terminates at or about the apex instead of on the costa. In both these species the discoidal cell in the



GONIODOMA LIMONIELLA. $\times 8$.

hind wings also is seen to be closed. The fore wings of *Goniodoma*

limoniella are of much the same shape as those of *C. lixella*, but palpable differences in the venation exist, the most important being that the discoidal cell is perfectly open. The subcostal traverses the wing in one bold and unbroken line, its fourth branch terminating on the costa, and the median is seen to be branched.

The hind wing is much narrower than any *Coleophora* I have examined, and the discoidal cell open, but the venation here is very faint and extremely difficult to demonstrate satisfactorily on account of the small size and delicacy of the wing membrane. *C. lixella* is evidently closely allied to *Goniodoma*, holding a position between the two genera. Briefly to recapitulate, the open discoidal cells and almost setiform hind wing, coupled with the habit of holding the antennæ, constitute, to my mind, a sufficient reason for retaining *Goniodoma*, at least, until we see our way to a thorough revision of the whole of the Coleophoridae.

The larva of *auroguttella* has been figured and described by Fischer von Roeslerstamm (Plate 86), and is, I believe, the only species of the genus at present recorded. The head is yellowish brown; the 2nd, 3rd, 4th, 11th, 12th segments yellow, and the 5th to 10th inclusive whitish. The 13th segment is black above, the 3rd segment being the broadest. The following rough description of the larva of *limoniella* may be useful for comparison. Length about 2'', width almost uniform, the 2nd segment being slightly broader than the rest. Colour pale yellow throughout. Head rich chitinous brown, 2nd segment with two rounded plates of the same colour, separated by a pale yellow triangular patch, the apex of which points to the head; 3rd segment with two dorsal brown plates and two smaller subdorsal ones, the latter being anterior to the dorsal. Between the 8th and 9th segments two longitudinal internal chitinous structures are visible through the skin, being probably connected with the dorsal vessel. The last segment is protected by a rich brown chitinous plate. There are also small plates on the 2nd, 3rd and 4th segments in the spiracular region. This larva may be found about the end of August on the flower-heads of *Statice limonium* in its case formed of a withered calyx. Later on it bores into the stems to pupate, when the hole is closed up and the case generally drops off.

One of my larvæ bored exceedingly neat holes through a chip pill-box, and another I found had entered the stem of *Atriplex portulacoides*. The precise behaviour of *millierella*, which feeds on the flowers of *Statice virgata*, is not ascertained. Whether pupation takes place in the case or whether the insect be double-brooded are points for future investigation. The larva of *auroguttella* lives in an angular case formed of the seeds of *Atriplex laciniata*, *A. patula*, and *A. latifolia*, and it seems not unlikely that a careful search on other species of *Chenopodiaceæ*, *Plumbaginaceæ*, and perhaps *Plantaginaceæ* and *Polygonaceæ*, may reveal the existence of other species in this beautiful and interesting genus.

24, Fleming Road, Lorrimore Square, S.E., March 21, 1885.

LEPIDOPTERA IN SOMERSETSHIRE.

BY REV. J. SEYMOUR ST. JOHN.

I AM sorry to find that Dr. Livett has experienced such a bad season in this part of the county last year. With me it was different, and I was rejoicing over what I took to be signs of better seasons in the future. It will be simpler and take up less space if I shortly enumerate my captures, with the number and variety of species I met with at Crowcombe, in the Minehead Valley. I have before written in the 'Entomologist' concerning what I deem to be the excellency of that locality, speaking entomologically. Perhaps my better success last year only proves this, and not that it was really a better season.

In March I took a very good specimen of *Dasycampa rubiginea* at the blossom of a rose tree; also *Xylocampa areola*, *Cerastis vaccinii*, *Scopelosoma satellitia*, *Selenia bilunaria* (*illunaria*), *Anisopteryx æscularia*, *Anticlea badiata*, several, *Hybernia marginaria* (*progemma*), *Cidaria siterata* (*psittacata*), *Diurnea fagella*.

In April, through the cold east winds, my only captures were:—*Pieris napi*, *Gonoptera libatrix*, common here, *Eucosmia certata*, and *Coremia designata* (*propugnata*).

May yielded a very good harvest, my note-book showing:—*Pieris brassicæ*, *P. napi*, *P. rapæ*, all equally common, *Pararge egeria*, common, *P. megæra*, *Vanessa cardui*, *Euchloë cardamines*, *Argynnis euphrosyne*, common, *Cænonympha pamphilus*, *Spilosoma fuliginosa*, *Gonoptera libatrix*, *Anarta myrtilli*, very common, *Hadena contigua*, *Rumia luteolata* (*cratægata*), very common, *Ematurga atomaria*, abundant, *Selenia bilunaria*, *Coremia*

ferrugata, several, *C. suffumata*, common, *C. designata*, *Anticlea nigrofasciaria* (*derivata*), *Cidaria silacea*, *C. truncata* (*russata*), common, *C. corylata*, *Venilia macularia*, *Pachycnemis hippocastanaria*, *Melanippe fluctuata*, *M. sociata* (*subtristata*), *Cabera exanthemaria*, *Phytometra viridaria*, *Numeria pulveraria*, *Tephrosia crepuscularia*, *Odontopera bidentata*, *Melanthia ocellata*, *Emmelesia affinitata*, common, *Acidalia fumata*, several, and *Alucita hexadactyla*.

June produced a far better variety and number of insects than the previous year; and if I had had more time to devote to the science, I could, no doubt, have shown up a still better "bag." What I did capture were:—*Argynnis selene*, *Demas coryli*, *Hepialus hectus* and *H. lupulinus*, common, *H. humuli*, common, *H. velleda*, several, *Spilosoma menthastri* and *S. lubricipeda*, both common, *Phalera bucephala*, *Lophopteryx camolina*, *Thyatira batis*, *Noctua festiva*, *Agrotis exclamationis*, not so abundant as last year, *A. strigula*, *Gonoptera libatrix*, *Xylophasia rurea*, *X. hepatica*, *X. monoglypha*, *Triphæna pronuba*, *Miana fasciuncula*, *Rusina tenebrosa*, *Apamea basilinea*, *A. didyma*, *Mamestra sordida* (*anceps*), *Numeria pulveraria*, *Rumia luteolata*, abundant, *Asthena candidata*, *Acidalia fumata*, several, *Cabera exanthemata*, *C. pusaria*, *Cidaria designata*, *C. truncata* (and *v. perfusca*), *C. suffumata v. piceata*, *C. immanata*, *C. fulvata*, common, *C. testata*, *C. dotata*, *Eupithecia exigua*, *Ebulea sambucalis*, *Boarmia repandata*, common, *Melanippe montanata*, abundant, *M. fluctuata*, *Panagra petrararia*, *Selenia bilunaria*, *Ligdia adustata*, *Metrocampa margaritaria*, *Timandra amataria*, *Tenegra atrata*, *Melanthia ocellata*.

July, like the previous month, brought me some species I had not before captured in the district, and I had no reason to complain, though "sugaring" did not quite come up to my anticipations. My list was as follows:—*Vanessa cardui*, *Epinephele tithonus*, *E. janira*, *Bombyx quercus*, *Hepialus humuli* and *H. hectus*, both common, *Plusia gamma*, common, *Xylophasia hepatica*, *X. monoglypha* (*polyodon*), *Aplecta nebuloza*, *Thyatira batis*, several, *T. derasa*, *Agrotis exclamationis*, *A. strigula*, *Leucania comma*, *L. pallens*, *Triphæna pronuba*, *T. fimbria*, *T. janthina*, *Cucullia umbratica*, *Mamestra persicariæ*, *M. brassicæ*, common, *Miana fasciuncula*, *M. strigilis*, *Hydræcia nictitans*, *Apamea didyma*, common, *Mania maura*, *Cidaria picata*, *C. fulvata*, *C. prunata*, *C. immanata*, *C. truncata*, *Boarmia repandata*, *B. gemmaria*, *Melanthia albicillata*, *Rumia luteolata*, *Emmelesia decolorata*, *Cabera pusaria*, *Acidalia aversata*, common, *A. bisetata*, *Larentia didymata*, common, *Macaria notata*, *Metrocampa margaritaria*, several, *Ligdia adustata*, *Iodis lactearia*, *Eubolia plumbaria*, common, *Nemeophila russula*, *Eupithecia nanata*, common, *E. oblongata*, *E. subfulvata*, *Timandra amataria*, *Hemithea strigata*, *Halia vuvaria*, *Lomaspilis marginata*, *Uropteryx sambucaria*, several, *Hypsipetes sordidata*, common, *Selenia lunaria*, *S. bilunaria*, *Camptogramma bilineata*, abundant, *Melanippe rivata*, *M. sociata*, *Zanclognatha tarsipennalis*, and *Crambus pinellus*.

August could not show so long a list as the two previous months, as I was away in the Isle of Wight and elsewhere during three parts of it; still I obtained *Vanessa io*, a large number from the larvæ found, *V. cardui*, abundant, *Hepialus sylvanus*, *Aporophila lutulenta*, *Apamea didyma*, *Larentia didymata*, *Melanthia ocellata*, *Cidaria testata*, and *C. truncata*.

September was a successful month, owing to warm nights and beautiful ivy-blossom. My captures were:—*Argynnis paphia*, *Vanessa cardui*, *V. atalanta*, common, *Notodonta dictæa*, from larvæ found, *Noctua glareosa*,

N. umbrosa *N. c-nigrum*, *Neuronia popularis*, *Anchocelis rufina*, common, *A. litura*, *Agrotis suffusa*, common, *A. segetum*, *A. saucia*, *Triphæna janthina*, *Tapinostola fulva*, *Amphipyra pyramidea*, several, *Calocampa vetusta*, *Orthosia macilenta*, *Xylina socia* (*petrificata*), common, *Xanthia circellaris*, and *Cerastis vaccinii*. Also one larva of *Atropos* fully grown.

October brought me some real good sport at the ivy-blossom and sugar, and insects were plentiful, coming freely to both. I netted *Triphæna orbona*, *Xylina socia*, *X. ornithopus* (*rhizolitha*), several, *Anchocelis rufina*, *A. pistacina*, *A. litura*, *Xanthia aurago*, *X. circellaris*, common, *Agrotis saucia*, *A. suffusa*, *Orthosia lota*, common, *O. macilenta*, abundant, *Cerastis vaccinii*, abundant, *C. spadicea*, *Scopelosoma satellitia*, *Miselia oxyacanthæ*, *Cidaria miata*, and *C. siterata*, several.

With the above list before me I can feel not only satisfied, but thankful.

Whatley Rectory, Frome, February 7, 1885.

NATURAL HISTORY NOMENCLATURE.

BY C. S. GREGSON.

IN defence of my questioned right to name a species after an individual, I must remind your readers of what has been done by others in a like manner. It is suggested that some board of reference should be constituted, before which proposed names should be submitted. But would it be possible to get anyone to act upon it? Take the names of some of the present leading entomologists, and see if they could.

Every gentleman who has been President of the Entomological Society of London, except Mr. S. Stevens, including the present President (with *Lithocolletis dunningella*, Stainton), has had a species named after him by some member of the Council or other naturalist; and nearly every assistant on the staff of the 'Entomologist' and 'Entomologist's Monthly Magazine' is in the same predicament. Dr. Knaggs christened *Nonagria bondii* (Kngs.); Stainton has given *Gelechia knaggsiella*, and other names after many of his friends; and it is only a few weeks since his last individual name, "*hodgkinsoni*," appeared.

I append a long list of individual names given by all the most eminent entomologists in different countries; and after reading them I do not see that objection can be taken to naming species after individuals. And as regards genera, both *Zelleria* after Zeller and *Banksia* after Sir Joseph Banks are in general use.

Since Linnæus wrote his descriptions and gave his names (from 1761—7), up to 1884, we find immense numbers of these personal names.

Among Coleoptera for example :—

Nebria gyllenhalii, *Scho.*, *Chlænienus schrankii*, *Duftr.*, *Ste. skrimshir-anus*, *Step.*, *Aëpus robinii*, *Lab.*, *Bem. fockii*, *Hum.*, *B. clarkii*, *Daws.*, *B. schuppelii*, *Dej.*, *B. sturmii*, *Panz.*, *Cybister rœselii*, *Fab.*, *Agabus sturmii*, *Gyl.*, *Hyd. davisii*, *Curtis*, *H. gyllenhalii*, *Schiodte*, *Euryusa kirbyi*, *Janson*, *Aleo. kirbyii*, *Steph.*, *Myrm. haworthi*, *Steph.*, *Homalota thomsoni*, *Janson*, *Stenus guynemeri*, *Du Val*, *S. erichsoni*, *Jan.*, *S. kiesenwetteri*, *Ros.*, *Homalium allardi*, *Fairm.*, *Choleva kirbii*, *Spence*, *C. watsoni*, *Spence*, *C. wilkinii*, *Spence*, *Scydmæus sparshallii*, *Denny*, *Anomala frischii*, *Koppe*, *A. donovani*, *Marsh*, *A. zenkeri*, *Germar*, *A. schonherri*, *Gyl.*, *Conopalpus vigorsii*, *St.*, *Anthicus schaumii*, *Woll.*, *Anaspis geoffroyi*, *Mull.*, *Apion gyllenhalii*, *Kirby*, *A. spencii*, *Kirby*, *A. curtisii*, *Kirby*, *A. waltoni*, *Steph.*, *A. hookeri*, *Steph.*, *A. germari*, *Wal.*, *A. schönherri*, *Waterhouse*, *Sitones waterhousei*, *Schol.*, *Tychius schneideri*, *Herb.*

Are these enough to prove we have long had a system of naming after individuals in the Coleoptera alone ; if not, then take the phytophagous Hymenoptera—I have before me, as I write, *Ten. fletcheri* and *saundersi* ; or let us examine the Tortrices among Lepidoptera :—

Lecheana, *Linn.*, *hartmanniana*, *Linn.*, *schulziana*, *Fab.*, *ratzburgiana*, *Sor.*, *daliana* and *bouchardana*, *Doub.*, *hawkerana*, *Stainton*, *penziana*, *Thumb.* ? *colquhounana*, *St.*, *P. mitterbacheriana*, *W. V.*, *paykulliana*, *Linn.*, *S. heegerana*, *Dup.*, *weirana*, *Douglas*, *D. petiverana*, *Linn.*, *C. wimmerana*, *Tr.*, *hohenwarthiana*, *W. V.*, *C. audouinana*, *Dup.*, *A. bauman-niana*, *W. V.*, *schreibersiana*, *Frol.*, *C. francillana*, *Fab.*, and *smeath-manniana*, *Fab.*

In the Tineidæ the Vienna Catalogue gives :—

E. steinkellneriella, *Zell.*, *zinckenella*, *Hub.*, *oehlmanniella*, *Fab.*, *thungerella*, *Linn.*, *swammerdamella*, *Zell.*, *schwarziella*, *Linn.*, *degeerella* and the Vienna catalogue, *schiffermillerella*, &c.

If we take examples from our birds we find the principle of giving individual names has been long practised. Thus we have :—*Noctua tengmalmi* of Selby (Tengmalm's owl) ; *Totanus bartramia*, Wilson (Bartram's sandpiper) ; *Tringa schinzii*, Brehm (Schinz's sandpiper),—this bird is also called *Tringa bonapartii* ; *Tringa temminckii*, Leister (Temminck's stint). But surely I have given sufficient illustrations ; if not I have only to lift my head, as I write in my museum, and see before me the fork-tailed petrel, *Procellaria leachii* ; or Jenyns' Bulwer's petrel,

Thalassidroma bulwerii; and Sabine's snipe, *Scolopax sabini*, Vigors; or turn round and see Richardson's skua, Bonaparte's gull (*Larus bonapartii*, Audubon), &c.: all of which remind me of many a pleasant day's collecting.

Were I to take Botany or Conchology these individual names would be so numerous that your readers would soon say—hold, enough.

Linnæus, the inventor of the binominal system, had few preceding or contemporaneous entomologists to honour; but what he had he utilised,—Réaumur, Swammerdam, Leuwenhoeck, Frisch, Roesel, DeGeer, Clerck, Geoffroy, &c.; all appear, as named by him, in our lists to-day.

I think that even the objectors to this system of nomenclature have enough before them to show precedent for giving names in honour of those fellow-workers in science whom we may admire.

Rose Bank, Fletcher Grove, Edge Lane, Liverpool, Feb. 10, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

SCIENTIFIC NOMENCLATURE.—As Mr. Chitty says, the custom of naming new species and varieties after individuals is a most objectionable one, and gives infinite trouble and annoyance to those who come after. It is difficult enough to remember reasonable names, without having one's memory taxed with a lot of names which are difficult to spell, difficult to remember, and in the case of some of the Russian names, at any rate, western entomogists find, almost impossible to pronounce. Nor is the malady confined to entomologists; every branch of Natural History is infested with these objectionable names. I take up, for instance, a copy of Kobelt's list of European shells, and at once I am met with such names as *Forchhammeri*, *Kickxii*, *Krynickyi*, *Karpinskyi*, *Erjavecii*, *Pulskyana*, and so on ad infinitum. And since these foreign names are so difficult for us to remember and so hard to pronounce, we must not forget that the English names are very likely equally annoying to foreigners. —T. D. A. COCKERELL; 51, Woodstock Road, Bedford Park, W., February, 1855.

NOTE ON *VANESSA ATALANTA*.—When watching some straw being taken out of a barn on the 15th January last, I observed three specimens of *Vanessa atalanta* on one of the bundles; two were dead, but the other was living, and on being removed to a warm room was soon flying about. Might not the dead specimens give a clue to the comparative rarity of hybernated specimens of this species being observed, some being too delicate to live through the winter? They were close together when seen, and were very much worn. If any of your readers could recall a similar case they would perhaps kindly let me know.—R. FREER; Gonville and Caius College, Cambridge.

CHEROCAMPA CELERIO AT RETFORD.—I have to record the capture last November, I think for the first time here, of *C. celerio*. It was taken from a tree in an orchard, and brought to me alive in a match-box, in which it had remained for many hours.—STEPHEN PEGLER; Retford.

DEIOPEIA PULCHELLA IN CORNWALL.—I think it may be of interest to your readers to know that on September 16th last I took a very fine and perfect specimen of *D. pulchella*, at the Lizard, Cornwall. I happened to be walking across the Downs about 3 p.m., when the insect started from amongst the heath.—ALFRED H. JENKIN; Trewirgie, Redruth, March 9, 1885.

ERIOGASTER LANESTRIS.—In the French work, entitled 'Faune Entomologique Française,'—Lépidoptères, by M. E. Berce, President of the Entomological Society of France, published 1867-8,—familiar no doubt to many,—the following occurs concerning *Eriogaster lanestris*:—"The perfect insect emerges in September and October for the first time; in March, April and May of the following year for the second time,—at least in the neighbourhood of Paris, Bordeaux, Besançon, &c.; for, according to Messrs. Constant, Guillemot, and Peyerimhoff, it only has one emergence—that of September—in the departments of Saone et Loire, Puy de Dôme, and Alsace." Has it ever so emerged in this country? If the warmer temperature of the summer months in France is the cause of the autumnal appearance of the perfect insect, why might it not be "forced" in this country? Perhaps some of your readers can inform me if this has been tried.—T. B. JEFFERYS; Pacific House, Clevedon, March 10, 1885.

BRYOPHILA ALGÆ.—I desire to ask about this rarity. How many have been taken in this country? I know of two only, which are in Mr. Sidebotham's collection, taken near Strines (Marple), near Manchester. If I remember rightly they were taken *in copulâ*, and brought to Mr. Sidebotham alive. He gave one to Mr. Edleston, the other he kept. Afterwards, when he purchased Mr. Edleston's collection, he got the other specimen back again; and I suppose it still remains in his fine collection. I have seen others,—a pair (reputedly British, of course) in a good collection; in another, even a series; but in the last case the owner knew nothing about their history.—J. B. HODGKINSON; Spring Bank, Preston, February 11, 1885.

GRAPHOLITHA (?) CÆCANA.—While collecting in the neighbourhood of Deal, in July last, I captured a specimen of *Grapholitha* (?) *cæcana*, which Mr. Sang, of Darlington, kindly named for me. This has been confirmed by Mr. Coverdale, the first captor of the species in Britain. The specimen is a fine female, very dark in colour.—J. TUTT; 45, Beaconsfield Terrace, Greenwich, S.E.

THE INFLUENCE OF WEATHER UPON LEPIDOPTERA.—From the following observations, amongst others, made during last year, it would seem that hot, no less than excessively wet, seasons have a prejudicial effect upon the transformations of Lepidoptera. In July, in "digging" coast sand-hills, I found twenty or thirty dead pupæ to one live one. Of course there were a few empty cases; but the dead pupæ far outnumbered both empty cases and live pupæ. Again, in working ivy, one-fourth of the specimens obtained were cripples.—GEORGE BALDING; Ruby Street, Wisbech, February 16, 1885.

MELANIC VARIATION IN LEPIDOPTERA OF HIGH LATITUDES.—Lord Walsingham, in his interesting address on this subject (Entom. xviii. 80) to the members of the Yorkshire Naturalists' Union on the 3rd instant, observes that the tendency to variation in many northern forms of Lepidoptera is in the direction of melanism, and that this tendency is observable in the majority of the Lepidoptera of the whole Arctic and Subarctic regions when contrasted with their more southern representatives. To this rule there are, however, some exceptions, and Mr. McLachlan, in a paper on the subject of "Variation in Lepidoptera" (Trans. Ent. Soc. Lond., 1865), after enumerating a number of species

which vary in the direction of melanism when occurring in the North of England and Scotland, observes that "on the contrary, there are a few species which become paler the further we proceed north." As instances of this he cites *Fidonia* (*Bupalus*) (*pinivaria*) and *Cidaria corylata*. To these two species I would add *Cænonympha typhon* (*davus*), the southern or English form of which is, in my experience, a much darker insect, both on the upper and under sides, than the northern or Scotch form, although the latter frequently occurs at a great elevation on the mountains. I have collected a long series of this species in Lancashire and Westmoreland, at an elevation of not more than four or five feet above the sea-level, which consists entirely of *dark* specimens, whereas the specimens I have received from Perthshire and other Scotch counties—many of which were, I believe, taken at a great elevation above the sea level—are all very light in colour, both on the upper and under sides; and the late Henry Doubleday possessed two specimens of *C. typhon* from the Orkneys which were almost white.—HERBERT GOSS; Surbiton Hill, March, 1885.

LEPIDOPTERA IN COUNTY CORK.—On the 20th of June last year I captured a specimen of *Melitæa artemis* on the top of a hill at least 300 feet above the sea-level near here. I had never seen the insect before, and was much surprised at meeting with it at such an altitude, for I always thought it a marsh butterfly. On the 22nd another was taken in the middle of the city of Cork, and on the 25th I took the third at least ten miles from the place where I caught the first. In the middle of August, about the 20th, I caught two specimens of *Colias edusa*, and saw two others, but seeing and catching this insect are not always the same operation. Three others were afterwards observed, all of which were males. Beyond *M. artemis*, *Argynnis paphia* is our only other Fritillary here, and that species is wonderfully common. Of other insects worth mentioning, I may enumerate *Satyrus semele*, *Macroglossa stellatarum*, *Procris ino*, and *Geometra papilionaria*. In the January number Mr. Sang records as exceptional a female *Hepialus humuli* taken during the end of August. The grass about our house teemed with these and with *H. lupulinus* last year, and between August 20th and September 9th I saw no less than five of the former moth.—HARRY C. SANDFORD; Bellevue Park, Military Road, Cork.

LEAF-MINING DIPTERA IN 1884.—The Snow-berry bushes (*Chiococcos racemosa*), planted frequently in pheasant-preserves for the sake of the white berries, which are said to be relished by our game birds, have been this year covered with their pretty white mines. Scarcely a leaf has been without its characteristic scroll. I noticed the fly, indeed, ovipositing at the close of April, and the mining of the larva was easily seen in June, and even earlier. The fly appeared in the beginning of July, and is by no means difficult to rear. I believe this to be the identical species recorded by Weyenbergh as occurring on the Snow-berry at Haarlem, and named by him "*Haarlemensis*." He says that the second generation remains in pupahood throughout the winter. The leaves of the fragrant white melilot gave evidence, apparently, of the mines of the *Phytomyza affinis*, of Macquart, the pupa-case being black, and imbedded in the pulp of the leaf. I was much interested in the exits of the fly, but, unfortunately, all were ichneumonated, and not a single miner appeared. Judging, however, by the artistically formed mine and other attendant circumstances, I have little doubt that the miner was *P. affinis*, of Macquart, my old acquaintance of 1882; and I am the more led to think so since the pea and the melilot are so closely allied. That most polyphagous of the Phytomyzidæ, *P. albiceps*, emerged on the 31st of July from its pupa-case attached to the leaf of *Angelica sylvestris*. Kaltenbach actually mentions sixteen plants that furnish food to this ubiquitous little fly. Among the plants recorded are seven of the Composites, four of the Labiates, three Umbellifers, a poppy wort, a Valerian wort, and one of the Borage worts. I could add a few more, chiefly from among the Composites. The last miner I have to record is *Phytomyza glechomæ*, Kaltenbach, that makes a conspicuous scroll on the surface of the ground ivy leaf, that reminds me somewhat of the appearance of a volume of steam from the funnel of a railway-boiler. The mines have been not uncommon this year on plants that have grown in shady places overhung with tree foliage. As I gave a detailed account of this *Phytomyza* in the December number of the 'Entomologist' of last year (Entom. xvi. 285), it will be superfluous to repeat the account.—PETER INCHBALD; Fulwith Grange, near Harrogate.

CHOLEVA SPADICEA NEAR NOTTINGHAM.—At the commencement of January I was fortunate enough to find *Choleva spadicea*

at the root of a tree near Nottingham. The Rev. W. W. Fowler was kind enough to name it.—THOMAS LUDGROVE; 21, Lytton Street, Long Edge Lane, Nottingham, March 16, 1885.

A REFLECTOR FOR EXAMINING THE VENTRAL SURFACE OF LEPIDOPTERA.—This instrument, which I have recently designed, is of easy construction and exceedingly simple, both in application and principle. It has been of great service to me, and the hope that others may avail themselves of its advantages is the motive for the following publication of its details. A thin glass microscopic circle, about one inch in diameter, is silvered and converted into a good mirror; a stout piece of wire, forming a handle, is beaten out at one end for about an inch, turned down at right angles, and the mirror mounted upon the flattened end, face upwards, with shellac softened in spirit, or any other cement. By the use of this contrivance the entire under sides of butterflies, &c., can be examined without their removal from the cork. It is only necessary to pass the mirror underneath the insect to obtain a good reflection of the wings, legs, anus, and organs of the mouth. By inclining the mirror at different angles various aspects of the face and palpi may be seen. I have found it particularly useful in the examination of *Lycænidae* and *Satyridae*. It succeeds best with insects mounted high up on the pins; but even when there is only just room to slide the mirror underneath it may be employed with effect.—GEO. COVERDALE; 24, Fleming Road, Lorrimore Square, S.E., February 14, 1885.

NAPHTHALINE. — There appears in the 'Entomologist' (Entom. xviii. 55) a note from Miss R. M. Sotheby referring to lump naphthaline. As I was the first person to mention this now generally-used substance, may I say that entomologists ought to be careful as to lump naphthaline? I have not seen that used by Miss Sotheby; but some time since a friend showed me a drawer, in the cells of which he had put some of this lump naphthaline, where the glass of the drawer and also the paper and insects were covered with black specks, which seemed to stick to everything in the drawer. I can only put this down to impure naphthaline, that is possessing iron and other impurities. The naphthaline I advocated some years ago in this Journal was that known as purified, in pure white crystals, very much resembling the flakes of nitrate of silver, as used in photography. Your readers will at once see the trouble and probable loss in

having one's insects covered with these innumerable specks. The kind mentioned by Miss Sotheby must certainly be better than the lumps as supplied from Germany, and which I complain of. The pure crystals are much more expensive, but in the end I think the dearest the cheapest.—EDWARD COOKE; 30, Museum Street, London, W.C., March 7, 1885.

EXCHANGING.—In marking his lists a beginner will, of course, start by marking the names of those insects which he has obtained, and leaving unmarked those which he does not possess. At first the blanks will preponderate: in the course of time the number of species marked and the number of blanks will become equal, while afterwards the blanks will go on decreasing. It is this state of our lists that Mr. Raynor objects to. But what would he have? Either we must all begin again a new list, as soon as the old one is half-full, or we must start at first by marking every species, and scratch each mark out as we acquire it. I venture to think that the former plan would be productive of much greater waste of time to the writer, and the latter of much greater confusion to the reader, than the present system. Moreover, I do not see how the reader wastes more time in looking for the blank spaces, as now, than he would in looking for the marks. Secondly, as to the giving away of insects. In former times, I take it, the number of first-class collectors in England might be counted on the fingers, while the total number must have been very small, and all who collected then did so for the love of the pursuit and not for greed or gain. There was no system of exchange as now,—there was neither scope nor reason for it; but, rather than throw away or destroy superfluous specimens, the richer collectors would give them to those who had them not, and thereby lend encouragement to the study. Now, thanks to the impulse given to Entomology, in the first instance by the works of Messrs. Stainton and Newman, and regularly sustained since, there is quite an army of entomologists in the United Kingdom, dealers as well as amateurs. Scope has thus been found for exchange, and a regular system introduced. At the present day promiscuous giving would be somewhat invidious: there are so many willing recipients of gifts. Besides this, the number of dealers renders it comparatively easy to obtain, at all events, types of any species we may require. I do not say that no giving takes place among friends; and there is

certainly one well-known and amiable enthusiast who yearly throws open his duplicate boxes to all beginners who may be in want of specimens.—W. WARREN; Merton Cottage, Cambridge, January 1, 1885.

EXCHANGING.—I perceive that Mr. Coverdale admits, in the February number (Entom. xviii. 48), the suggestion thrown out by the Rev. Mr. Raynor in the January number (Entom. xviii. 23), that entomologists are to-day more selfish than of yore. I do not think this is so at all; but the times have changed. Thirty years ago there was only one entomologist where there are now thirty who collect, and an invitation which then attracted twenty or thirty would now bring 300 applicants! Mr. Raynor makes it a virtue to have an appreciation of the value of time. Let him calculate how long it would take to receive, re-pack, address and despatch 300 boxes, accompanied probably by notes apologising for sending two insects when twenty-four were asked for, or for having to return an empty box. It would be a great undertaking, and moreover a most ungrateful one. I remember that some six years ago a case of the kind occurred. The late Mr. E. Birchall advertised 500 *Zygæna pilosellæ* (minos) in this manner. He received 200 applications; distributed his 500 insects among 170 in twos and threes; returned some empty; and, in consequence, a number of insulting letters and reproaches instead of thanks.—STEPHEN PEGLER; Retford, February 23, 1885.

A REFERENCE COLLECTION.—I cannot but think that giving away specimens on a large scale is injurious both to the giver and to the recipient. It seems to me like giving a penny to the habitual beggar, an apparent kindness which really only induces sloth and not activity. It is not as if beginners had nothing to give in exchange; anyone, beginner or not, may with a little hard work find many local and rare species in his district, however poor it may be; and even if he is unable to supply his correspondent with any species he really wants, I think it is better to take what he has than to take nothing in return; for this, at any rate, stimulates him to further activity, with the hope of further exchanges. The only instance in which I would encourage free gifts is in the case of obscure and critical insects, and in such cases I have no doubt a correctly-named specimen is of the greatest value to a beginner, as it gives him help which he could not otherwise obtain. Are entomologists any the less

ready to help those who are ignorant? I think not, if there is any real need for help. Has anyone ever had a doubtful insect that he was at a loss to identify, and has met with a refusal? I do not know what the experience of others may be, but for my part I have always found them most willing and ready to help in such matters, where help is really of service. But if there are still entomologists who long to help the novice, and are not satisfied with the above means, there is yet another way. Might not some body of men form a collection of British insects of all orders, correctly named and in good condition, and let them out, under specified regulations, to entomologists all over the country? I am sure that there must be many entomologists, experienced and inexperienced, living in distant parts of the kingdom, who would give a great deal to have the chance of seeing a well-authenticated series of any particular family or genus that they were working, and would regard such a collection as the greatest boon. I think there would be no difficulty whatever in getting such a collection together, for I feel sure that everyone would be only too willing to help with specimens for such a purpose.—T. D. A. COCKERELL; Bedford Park, Chiswick, March 3, 1885.

CAMBRIDGE ENTOMOLOGICAL SOCIETY.—The annual meeting of this society was held on February 7th. The number of members has been lately increasing, and now reaches twenty-four. There was a good attendance, and several interesting exhibits were shown. Mr. Bryan's five cases of Ceylon Lepidoptera led the way. The President, Mr. John Brown, showed two cases of British Coleoptera. Mr. Alfred Jones showed some fine series of *Cymatophora octogesima (ocularis)* and *Acronycta strigosa* taken at Cambridge in the past season. Mr. Wheeler kindly lent some examples of Norfolk fen-insects: among them were *Nonagria cannae*, *N. brevilinea*, *Senta maritima (ulvæ)*, varieties, and *Apamea ophiogramma*; also *Phorodesma smaragdaria*. The Hon. Sec., Mr. Cropper, exhibited *Bryophila par*, *Meliana flammea*, *Tapinostola hellmanni*, *Nonagria neurica* from this neighbourhood; also specimens of the latter from Lancashire, and a male of *Odonestis potatoria* of the normal colour of the female, bred from a cocoon taken at Wicken Fen. It was specially noticed, among the work done by members in the past year, that Messrs. J. Brown and A. Jones had been successful in taking the larvæ of *Bankia argentula* in the fens.—W. F. H. BLANDFORD; Trinity College, Cambridge, February 23, 1885.

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THE GENUS *SCOPARIA*.

BY CHARLES A. BRIGGS.

THE near approach of another season urges me to ask the assistance of lepidopterists towards extricating this genus from the confusion into which it has been allowed to fall. Highly interesting as the genus is, easy as the species are both to breed and to take in abundance in their particular localities, yet it seems to have always been looked upon as a genus to be avoided, and one difficult to master, as was the genus *Eupithecia*, before the labours of Harpur Crewe, of Gregson, Porritt, and others cleared away the difficulties by which that genus was surrounded.

This avoidance probably arose from three causes:—The first was a wide-spread error, traceable to a high authority, that *Scopariæ* would not bear pill-boxing, and should be killed, and even set, on the field, though how this was to be carried out in practice did not appear. This calumny, once spread, has clung to the group, although, as a matter of fact, the specimens, if kept fairly cool and quiet in a decent sized glass-topped box, are as well behaved as one could wish. The second cause is that everyone who has touched the group has tried to evince his earnestness and zeal by adding to the already over-laden list; and not only that, but if a new species was separated from an existing one, it was described independently, without clearly pointing out the characteristics that distinguished it. The third cause was that, as a rule, a new, or so-called new, species got placed in a different part of the genus from its nearest ally, thereby greatly increasing the difficulties attending the group. Thus in Mr. South's list *S. ingratella*, which is a mere variety

of *S. dubitalis*, is absolutely separated from it by *S. conspicalis* and *S. murana*, the former of which ought clearly to come next to *S. ambigualis*, instead of being separated from that species by four others. In the same way, *S. atomalis* is placed between *angustea* and *gracilalis*, with neither of which has it any special affinity, even assuming that each of these species is entitled to specific distinction, which I am inclined to doubt. *S. truncicolella* is also widely separated from *S. basistrigalis*, which it more nearly resembles; while *S. ulmella* is crammed in between *mercurella* and *cratægella*, apparently in order to interpose a scientific frontier between two species so often mixed.

The only way in which this group can really be mastered is by independent working in different localities, followed by comparison of notes and specimens.

I am somewhat inclined to believe that future observation will show that *S. zelleri* (so far at all events as our English specimens are concerned), *S. atomalis*, *S. ingratella*, and *S. gracilalis* must all lose their claims to specific distinction; that *S. zelleri*, with its already defunct ally *S. scotica*, will be merged in *S. cembræ*; and *S. atomalis* in *S. ambigualis*. Apparently distinct as these two so-called species are, if extreme specimens only are contrasted, yet intermediate specimens of every possible degree of gradation are familiar to us all, and who can define the boundary-line where *ambigualis* ends and *atomalis* begins? So again, *E. ingratella* must sink as a mere pale form of *S. dubitalis*, common to chalky localities; while *S. gracilalis* will seek refuge under the name of *S. alpina*. Of *S. basistrigalis* I know but little; while *S. cratægella* and *S. mercurella* seem somehow to be strangely mixed.

Will entomologists in the coming season turn a little attention to this fine group in general, and to these six species in particular, so that we may see what species we really have? According to my misgivings it will resolve itself into:—

- | | | |
|-----------------------------|----------------------------|----------------------------|
| 1. <i>S. cembræ.</i> | 5. <i>S. conspicalis.</i> | 11. <i>S. cratægella.</i> |
| b. var. <i>zelleri.</i> | 6. <i>S. ulmella.</i> | 12. <i>S. resinea.</i> |
| c. var. <i>scotica.</i> | 7. <i>S. phæoleuca.</i> | 13. <i>S. lineolea.</i> |
| 2. <i>S. truncicolella.</i> | 8. <i>S. dubitalis.</i> | 14. <i>S. angustea.</i> |
| 3. <i>S. basistrigalis.</i> | b. var. <i>ingratella.</i> | 15. <i>S. alpina.</i> |
| 4. <i>S. ambigualis.</i> | 9. <i>S. murana.</i> | b. var. <i>gracilalis.</i> |
| b. var. <i>atomalis.</i> | 10. <i>S. mercurella.</i> | 16. <i>S. pallida.</i> |

NINE DAYS AT RANNOCH.

BY ARTHUR J. ROSE AND OLIVER C. GOLDTHWAITE.

THE writers of this report came under the category of "enquirers," mentioned by Mr. Carrington last July, when an account of this hunting-ground was given in the 'Entomologist' (Entom. xvii. 145), and they take this opportunity of thanking our Editor for his kindness in giving so many useful hints.

We left King's Cross on Friday, 27th June last, by the mail train, bound for Struan, on the Highland Railway, distant about thirteen miles from Rannoch, or Kinlock Rannoch, as the place is termed in the maps. Finding, however, that we had waited too long at Perth on Saturday morning, and that the next train would not arrive at Struan in time to catch the post-cart to convey our luggage across country, we alighted at Pitlochrie, a few stations earlier, determining to walk through the beautiful Tummel Valley, past the Queen's View, to Rannoch, distance twenty-one miles.

This being an account of an entomological trip forbids our wandering into raptures over the really grand scenery through which the traveller passes on making this *détour*, but all entomologists fond of fine scenery, and strong enough for the walk, will consider this way of approaching Rannoch well worth the labour.

About two miles beyond the Bridge of Gany, as we were approaching the Tummel Valley, we came upon a beautiful glade of birches leading down to the river, which was foaming, splashing, and eddying against the rocks. Turning into this copse we immediately found *Lycæna astrarche* var. *artaxerxes*, a species new to both of us, and within two hours of our collecting in "bonnie Scotland." Although we had travelled all night, and had a long tramp before us, the temptation to remain here a little was too strong, and we were rewarded by taking between us a score of this pretty little butterfly, which we did not see again during our stay. On the road we beat out two *Cidaria silaceata*, and several special forms of *Cidaria immanata*; noticing also that *Tanagra atrata* (*chærophyllata*) was very plentiful among the bracken.

We arrived at Rannoch about 10.30, tired out, but very pleased with the prospect of hot fine weather. Sunday was

devoted to visiting the kirk and a quiet stroll round; and on Monday morning we were up betimes, and after a good Scotch breakfast (porridge included), and a dip in the loch, wended our way to Innerhadden burn, by the side of which we ascended into Glen Sassun. After following the path for about a mile, we commenced wading through the heather, and here captured *Melanippe tristata*, *Larentia salicata*, a few *Melanthia ocellata* and *Eupithecia nanata*; and were glad to find a few *Cænonympha typhon* (*davus*), which from their condition were evidently only just emerging. We found this butterfly preferred the damp hollows in the mountain sides; and our general experience was that where the heather was sprinkled with moss and sweet-gale, there you would take this species. One *Emmelesia minorata* (*ericetata*) was also taken flying over the heather; and of course our old friend *Anarta myrtilli* was to the fore, as usual.

We were informed very kindly by Mr. Thos. Eedle, among other things, that *Erebia epiphron* var. *cassiope* was to be sought further up the glen, and accordingly we made our way along the rough track till we reached a stone wall, which by knocking yielded two or three fresh *Coremia munitata*, and several *Larentia salicata*. A further tramp of two miles brought us to an old "bothy," and around here is said to be one habitat for *cassiope*. It is about a 2000 feet climb. A long search did not produce the desired effect, but by tapping the stones some very fine *Larentia salicata* were netted. In fact during the whole of our stay we found that several species which were faded in the lower land, could probably be taken in good condition by ascending another 1000 feet.

We returned after a hard day's work, had tea, and set out again to sugar along the shore of the loch. It was not dark till 11, so we had time for a rest and a little setting. The vegetation around the loch chiefly consists of alders and birches, with an undergrowth of bracken, wild rose, bramble, and honeysuckle; but, notwithstanding the encouraging prospect, not a thing came to sugar, and we only netted *Emmelesia adæquata* (*blandiata*), which was just emerging from pupæ. So we retired to bed at midnight, thoroughly satisfied, but very tired, with our first entomological experience in Scotland.

Tuesday, 1st July, was a fine warm day, and we again visited Glen Sassun. We spent a good part of our time tapping the

rocks, along the edge of the burn, but only succeeded in capturing a small proportion of the insects thus dislodged. However, some beautiful forms of *C. munitata*, *L. salicata*, and *M. tristata* rewarded us; and by beating the birches, also alongside and over-hanging the burn, many fine varieties of *C. immanata* were obtained. Here we stayed to admire the wonderful peak of Schiehallion, towering grandly above the mountain range, and here and there tinged with snow; whilst at the head of Glen Sassun, near the summit of the range, a fine belt of snow, some half mile in extent, was glittering and sparkling in the sunshine. But we must push on, for it looks a good day for *E. cassiope*, and we are both greatly longing to add this species to our captures. But as we reach the desired neighbourhood the clouds gradually obscure the sun, which, however, shines intermittently, and prompts us to watch the long coarse grass upon which the larvæ feed. After passing an hour or so in this way we were compelled to give in, no *cassiope* appearing, and we returned home somewhat disappointed.

In the evening we returned to Innerhadden, and worked the meadows near the burn on the other side of the road, and found *Emmelesia albulata* in great plenty, but it was getting worn, and we did not obtain any varieties. *E. adæquata* also came to the net, together with a few fine *Melanthia ocellata*, *Eupithecia nanata*, and *Hepialus velleda*.

July 2nd. We walked along the road, past the Altmore Falls, and climbed over the wall into some meadows, and by searching the rushes, for it was very dark, obtained some very fine specimens of *Lycæna icarus* (*alexis*), when we remembered reading in Newman's 'Butterflies' of the size and brightness of Rannoch specimens taken by Mr. Eedle many years ago. On pinning these specimens at home, great was our delight to find two decided varieties, the difference being that several black markings could distinctly be seen, just within the margin of the lower wings. Of course we revisited this locality, and then we took two more like specimens. It would be interesting to know if this variety is peculiar to Rannoch, or whether it has been taken in the South of England. In the afternoon we again visited Glen Sassun, where we captured two very dark forms of *Argynnis selene*, and two *E. cassiope*, by the side of a little mountain spring, but it was getting towards evening, and so we deferred climbing

another thousand feet till the next day, July 3rd, which was gloriously fine, and to our great joy we induced *E. cassiope* to leave its hiding-place among the long grass. We spent the best part of the day here, for immediately the sun went in no *cassiope* were to be seen. We took about sixty specimens between us, all in magnificent condition; in fact we boxed some, because the wings were hardly dry. It is an easy insect to catch, but should you miss it, in a high wind, you will find considerable difficulty in getting a second chance. When the sun is out, however, it is very fond of disporting itself on the tops of the long grass, and in this position we captured several. A word of warning may be given here, if any of your readers are anxious to take *cassiope*: don't put off working for it while bright weather lasts; for although we visited this spot two or three times again, we never had another opportunity of taking it plentifully, only a few stragglers falling to our lot. Both on this day and the next we worked for *C. typhon*, which could not be termed plentiful, and some very fine female specimens, almost white at the outer margin, were obtained; the Scotch form differing very much from those taken at Witherslack the previous year.

The evenings were spent along the shores of the loch, but despite the strongest of rum and the best of sugar, not a single *Noctua* could be tempted to taste the feast. *E. adæquata* was literally swarming, getting on the wing by 7 o'clock, and a very nice series was obtained of this pretty insect, but scarcely anything else was to be seen.

July 4th. As we intended going to the Black Wood by the post-cart at mid-day, we spent the bulk of the morning in pinning and setting our captures, and taking a few more *L. icarus* in its old haunts, taking the precaution to book our seats on the post-cart first thing in the morning. There is a good road round the loch, along which an ordinary bicyclist or tricyclist would have no difficulty in travelling; this we mention for the benefit of those who would like to work this grand hunting-ground thoroughly, it being about eight miles from Kinloch, and it is very doubtful whether lodgings could be obtained in the neighbourhood.

The road to the Black Wood is fully described in last year's, 'Entomologist' (Entom. xvii. 150), and the driver of the cart was quite able to tell us that "*alpina*" was to be taken at night; "on that crag, or among them birches up the burn," the Kentish

glory is taken when the snow is knee-deep. Swarms of *Geometræ* flew out of the pines, dislodged partly by the wind, and partly by the vibration as we passed; and among others we thought we recognised by its superior size and peculiar slate-coloured appearance, the local variety of *Boarmia repandata*.

On alighting we commenced searching the boles of the pine trees, obtaining three varieties of the above; some magnificent forms of *Larentia cæsiata*; a few *Bupalus piniaria*, the pale patch in the centre of the wings being white instead of yellow, but the species was worn, and not worth taking; *Thera variata*, also worn; and, by carefully watching the bilberry, half a dozen *Halia brunneata* (*pinetaria*), just emerging. The afternoon was very windy, consequently we lost many an insect by being unable to chase it over the rough broken ground. We mothed all the way home in the dusk, obtaining, however, only *L. cæsiata*, *Coremia munitata*, *C. immanata*, and our old friend *E. adæquata*.

The next day we walked along the road past Tempar, and turning to the right crossed several walls, with Schiehallion right ahead of us. On one of these walls we took *E. minorata* in plenty, whilst *L. cæsiata* was a perfect pest. We also worked a very picturesque burn in this neighbourhood, but the result was much the same as at Innerhadden. In the evening a solitary specimen of *Dasydia obfuscata* was the only new capture; and an attempt by both of us at trout fishing proved futile. Another journey was made to the Black Wood, but it turned very stormy, and only by luck did we happen to obtain a few more *H. brunneata*, and one *Cidaria populata*, almost black.

On July 7th the weather completely broke up, and one of us stopping on for a few days longer gained nothing entomologically by the extended time. We were, however, thoroughly satisfied with the work done, which, by-the-bye, is very much harder than entomologising in the South of England; and only those who can stand a long tramp over rough mountainous country should entertain a visit to Rannoch. Our conviction is that the insects sold by dealers, who work the place, are thoroughly worth the price asked,—for example, imagos of *Pachnobia hyperborea* are chiefly to be obtained by spending the night on mountain crags enveloped in mist; this last condition being said to be essential to a "good" night.

We were fortunate enough to obtain comfortable lodgings in

the village, which we can thoroughly recommend; and any other information we are possessed of will be willingly given by the writers.

11, Kyverdale Road, Stoke Newington;

2, Grove Villas, Grove Road, Walthamstow; April, 1885.

NOTES ON THE CAPTURE AND PRESERVATION OF COLEOPTERA.

BY LYONELL FANSHAWE.

II.—KILLING AND PRESERVING.

VARIOUS methods are employed by collectors for killing beetles, and I will now enumerate some of the quickest and most effective ways. Undoubtedly the speediest, and, in most cases the best, plan is the following:—Immerse a piece of muslin in water absolutely boiling, and throw the insects upon it; an instant will suffice to deprive them entirely of life, and then they can be lifted out all at once and allowed to dry on a sheet of clean blotting-paper. A few, which would be affected by boiling water, may be killed and preserved in spirit, but it renders them rigid.

The "laurel-bottle," described in the previous paper, is a very favourite means of killing, the only drawback to this being that laurel has a tendency to stiffen the legs; this can be remedied by leaving the insects in the bottle for a day or two, when they will be found perfectly relaxed, or you may relax them at once by plunging into hot water. If left too long in the bottle the legs are very liable to come off altogether when being arranged. Dropping them into a box containing cotton-wool saturated with chloroform is another way. This is not a good plan, however, as many beetles become rigid or are extremely hard to kill, and, after having been set and even put away in the store-box, they have been found still alive. The next question is how to set. Moderate-sized beetles should be pinned with the entomological pins sold for the purpose; the pin should be thrust through the right elytron near the shoulder. Great care must be taken that all the pins are exactly upright when placed in the cabinet, as nothing looks worse than to see them slanting

in all directions. In the case of a large insect like *Lucanus cervus*, it is advisable to make a small hole first with the point of a fine needle, or otherwise the very hard elytron will probably turn the point of the pin. Also, when passing the pin through the body, be careful that it does not force off one of the legs. The legs, antennæ, palpi, &c., are then drawn out into a natural position, and fixed with pins or braces.

The smaller beetles must always be set on stiff white card. If run through with a pin it is sure to carry off a leg or otherwise disfigure the body. If the collector expects to have plenty of time to spare during the year, he will find it a very good plan to set his beetles temporarily in batches of a dozen or more on a slip of stout card with a very little thick gum, then, when in town, or for other reasons unable to collect, the cards can be immersed in hot water for an instant, and the beetles conveyed, ready set, on to a piece of white card, on which the smallest drop of coaguline sufficient to hold them has been placed. By this means all scratches will be avoided on the card. Attached to each card should be a very small label, on which a number is written corresponding to a number in a book, giving date, locality, and any particulars worth remarking, or the number may be written at the bottom of the card. This doubtless entails a certain amount of extra trouble, but in the end it makes the collection much more valuable and interesting.

The first and most important consideration when setting a beetle is to give it plenty of card, and to set the limbs, antennæ, and all the organs of the mouth out thoroughly well. In many of the genera where the species are all small, and closely resemble one another, it is absolutely impossible to identify them unless the organs of the mouth and limbs can be minutely examined; but, besides this, nothing looks worse than to see a beetle crammed on to a tiny piece of card just large enough to hold it, with the legs tucked up all round, and the antennæ not showing at all. If too much card-space is given, some can be cut off afterwards, but if not enough, one cannot put more on.

It is the general rule not to put more than one beetle on each card, but some collectors prefer two or more. One in each series should be set on its back, so that the mouth and under surface may be examined more easily.

Some of the smaller Brachelytra will be found very difficult

to set well, on account of the tendency the segments of the abdomen have of gradually contracting as the insect dries. The following is the Rev. J. G. Wood's method of preventing this:—"Fix the last segment of the body to the card with a little coaguline or diamond cement, which soon sets. Then, when it is sufficiently hardened, take the front part of the body in the forceps, and draw it gently forward until the segments of the abdomen have been pulled out to their proper extent. Then put a small drop of coaguline under the thorax, press it down with a card brace, and keep it down till dry." The length of the pin used for carding varies, of course, according to the collector's taste, and it does not much signify what the length may be, provided that every pin is of the same length.

The card should be pushed close up to the pin-head. In the cabinet all the cards must be pushed to precisely the same height in every drawer; if they are all at different heights, even though very slightly, it gives a very slovenly and untidy appearance.

We now come to the last, but nevertheless very important, consideration of how and where to store our captures. A cabinet is the receptacle most generally used for this purpose, and if a really good one is procured no better place could be found. A really good cabinet should be made throughout of old, well-seasoned, oak or mahogany, and will cost from fifteen shillings to a guinea per drawer. The British beetles will occupy about twenty-eight or thirty drawers. The only way of being certain of getting a genuine article is to go to a respectable maker and pay a fair price, but very good cabinets may often be picked up more cheaply second-hand at Stevens' Rooms in Covent Garden. The size of the drawer generally used is eighteen inches square, and each drawer must have "cells" round the sides to contain pieces of naphthaline. Clear of the cells the drawer should measure $16\frac{1}{2}$ by $14\frac{3}{4}$ in.; the depth, exclusive of the cork, $1\frac{1}{4}$ in. It is imperative to have these cells always well stocked with preservatives, or else mites and numerous other horrors will enter, and damage in a few weeks the labour of years.

To the front of every drawer should be glued a small slip of card with the names of the families contained therein printed on, thus—I. CICINDELA to PTEROSTICHUS; so that one can determine at once and without any trouble which drawer contains the insect required. It is better to place the cabinet a few inches away

from the wall, to allow of air circulating, and care must be taken not to place it against an outside wall, lest possible damp warp the wood. If a cabinet is beyond the present means of the collector, store-boxes will do equally well, in fact they are preferred by many. These boxes can be purchased, covered with cloth, so as to resemble books.

The most recently published and best list of British Coleoptera is that by Revs. A. Matthews and W. W. Fowler (West, Newman & Co.) This can be bought printed on one side only, for labels. When commencing to arrange the drawers, the collector should, if possible, consult some standard cabinet in order to ascertain the amount of space to be left for each species. The number varies, but it is generally from nine to twelve. The lines should be ruled in with a fine, hard, sharp-pointed pencil, so that they may be easily erased at any time if necessary.

Between each genus a space may be left in case of a new member of that genus being discovered, which can thus be inserted in its proper position without disarranging the rest of the contents of the drawer.

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COLLECTING THE GENUS *EUPITHECIA*.

BY JOHN T. CARRINGTON, F.L.S.

(Concluded from p. 112.)

No more pleasant early summer holiday can be spent than in searching for imagines of *Eupithecia pusillata*. These are to be disturbed from among spruce trees in the South of England in May. I have not taken this species far north, but it may be possibly found in many new places, simply because it has not been looked for. Those localities best known are Wickham Woods and Boxhill, or more correctly by the side of Headly Lane, where the spruces have grown large. The moths may be turned out of the branches with a stick, by gently agitating them, but are easily damaged, and soon begin to look somewhat seedy after a flight or two. They are, therefore, best bred; and the larvæ are to be beaten from the spruce about the first of July. It is far less trouble, however, to get eggs and rear a series through all their

stages, and much more instructive. *E. exiguata* requires one to go to more cultivated spots, for its most common habitat is by the whitethorn hedgerows, which form the great charm of English rural scenery. Soon after the leaves are well out, in May and on into June, this moth may be taken flying on the sheltered side at dusk. The larvæ are to be beaten into an inverted umbrella in August and September; but again a batch of eggs are perhaps less trouble in the end, for they may be "sleeved" out in one's garden, and the little larvæ take care of themselves, but are better perhaps with earth for the pupæ to winter in. This may be arranged by tying a small flower-pot at the other end of the sleeve when the larvæ are getting full-fed; but do not forget to plug up the hole at the bottom of the pot, as worms or other "beasts" may get in, or the larvæ get out, if inclined to burrow too deeply.

As soon as the crab-apple flowers begin to show pink buds one may look for the larvæ of *E. rectangulata*. It also feeds commonly on the flowers of the cultivated varieties of apple. We breed, however, very different forms of moths from the crab-apple flowers, they being usually finer, brighter green in colour, and more regularly marked. I have seen moths bred and taken among apple trees in orchards which were almost uniformly black. The difference in colour and markings, clearly produced by the cultivated food, is very curious, and should be carefully investigated. It is only necessary to beat—gently, if in the orchard—the flowering branches over an umbrella to find the larvæ of this species, and the moths will be found in the neighbourhood of apple and crab-apple trees in June. A long series of *E. rectangulata* shows great variation.

One of the rarest, and at the same time most beautiful, members of the genus is another apple-feeding species. This is *E. consignata*, which appears to have its head-quarters in the apple orchards of the West of England. It may be found in May and June, sitting at rest on the trunks of the apple trees, and under the thicker branches. The larvæ feed in June and July upon flowers and leaves of apple, and are best reared from a batch of ova, for one can hardly expect the apple growers to allow us to beat the trees to the damage of the future fruit-crop.

Eupithecia coronata is one of the few double-brooded species of the genus. Early examples, lovely in their delicate green garb, until a wet night or two destroys this evanescent colour,

may be found on palings or tree-trunks quite early in April and through May; while the second brood occurs in August. It is by no means a common species of the genus, although it occurs in many localities. The larvæ feed—the summer brood in July and August on clematis, and the autumn brood in August and September upon flowers of the hemp-agrimony and golden-rod. It is well worth rearing, as the bright colour of perfect specimens so soon disappears in a state of nature. The autumnal food may be kept in the bags already described; and having beaten a few flower-heads into an umbrella or beating-tray, and found a larvæ or two, it is unnecessary to look for more, but simply gather the food without shaking it too much, and trust to seeing these perfect little gems in due course next spring.

In June we must be up betimes in the morning, if we would like a good series of *E. fraxinata*. Our business will be to examine the trunks of ash trees between eight and nine o'clock in the morning. If the species is there, and we may expect it wherever ash grows in plenty, we shall find the moths just emerging from pupa, and drying their wings. The larvæ pupate among the crevices in the rough bark of the trees, where sharp eyes can find the pupæ in their silken cocoons. Otherwise this moth is difficult to get, for they soon leave the tree trunks as they dry their wings, and as the day advances. The larvæ may be beaten from ash in August, with occasional larvæ of *Eugonia fuscantaria*; but the moths are rarely seen when flying. *E. fraxinata* appears to prefer old well-grown trees.

Until the larvæ were accidentally discovered by Mr. Baker, late of Derby, *E. valerianata* was considered a rare species. It was then known as *E. viminata*; and one day Mr. Baker had thrashed some osiers long and valiantly, but to no purpose, thinking, as the name implied, the willow leaves were the food. Tired and disgusted he gathered a bunch of the common valerian, then in the full beauty of its delicate lavender flowers, to ornament his home. On looking them over for chance larvæ, nothing was to be seen; but later at night, on suddenly entering the darkened room where they had been placed in water, to his astonishment the whole bunch of flowers was alive with larvæ of this moth. So it is with many *Eupithecia* larvæ; it is waste of time to look for them; and it is best to carry home the food, and deal with them as described in the first portion of

these remarks (Entom. xviii. 111), and trust to the moths appearing at the proper time.

In very different localities must we look for *E. constrictata*. The moths are to be taken flying over dry banks, or chalk or limestone hill-sides, over the beds of wild thyme, in July and August. It is seldom to be taken in good condition, and it is not easy to rear, though possibly the larvæ might be induced to eat the flowers of garden varieties of thyme. I have taken this species near Richmond, in Yorkshire; and commonly on the Hill of Howth, in Ireland. It is said also to occur in Scotland.

Among our most easily-obtained pugs, and one which is frequently most neglected in collections, is *E. subnotata*. This is a regular garden species, and is to be found where the common goose-foot (*Chenopodium*) abounds. It flies freely in June and July, from ten to twelve at night, flitting from one flower or seed-head of its food-plant to another; and may be found in fine condition, and often in plenty, where the goose-foot has been allowed to grow freely. Shaking the seed-heads over an inverted umbrella during August will generally produce the larvæ, if worked for at night. Another garden species is *E. assimilata*, which larvæ feed under the black currant leaves early in October. They also feed upon wild hops (*Humulus*), riddling the leaves with little holes, as though the plants had been shot at with pellets from a gun. We shall find, however, that the larvæ feeding on the hop leaves are very different from those feeding on the black currants, being much brighter in colour, often showing brilliant tints, such as pink and carmine, which varieties never appear on the currant bushes. There does not seem, however, to be much difference in the moths reared from these brilliantly-coloured larvæ. This moth is double-brooded, appearing in May and August.

A few specimens of *E. sobrinata* may be at times taken at the suburban lamps. These are to be traced to the cultivated varieties of juniper in the ornamental gardens. We must, however, search for the larvæ in May and June, or the moths in July, amongst the wild junipers, if we want a good series of this species, which appears to occur freely wherever juniper abounds. An *Eupithecia* has been taken most seasons in the neighbourhood of Dover; first by Mr. Samuel Stevens long years ago, and latterly by Mr. Sydney Webb and others. Whether this is an extreme form of *E. sobrinata*, or not, I cannot say. I

believe the captors think otherwise, and will probably some time or other describe it under a less fantastic name than some of those which have latterly been proposed for moths. It was thought to be the *Eupithecia ultimaria* of Boisduval, but this is doubtful, although that name in consequence appears in our newest list.

As we wander through the woods in July we shall probably see a patch of that handsome flower, the foxglove (*Digitalis purpurea*). If we examine the lower flowers on a spike we shall probably find some of them with their mouths closed, as though by a spider spinning its web. If we open them we shall find a fat, stumpy *Eupithecia* larva in each. These are of *E. pulchellata*, and we had better gather a goodly number, for they are sadly infected, as a rule, by parasitic ichneumons. The very closely-allied *E. linariata* is found in the larval state commonly, feeding upon seeds and wasted flower-heads of common toadflax (*Linaria vulgaris*) somewhat later in the year. Neither are common in the imago state, and the latter is most easily reared by gathering a bagfull of flower-heads in August and September, and trusting to the moths appearing next season.

By hedgerows and road-sides the burnet-saxifrage (*Pimpinella saxifraga*) grows commonly. Amidst this in June we should find an occasional imago of *E. pimpinellata*; but it is better to beat for the larvæ, which in some seasons may be taken in fair numbers from the seed-heads, for they feed upon the unripe seed-umbels in September. This species is better for having a little turfy mould, in which to pupate. Continuing our search among the seeds of other *Umbelliferae*, we must give great attention to those of the wood angelica (*Angelica sylvestris*), for on these we shall find two species, viz., *E. albipunctata* and *E. trisignata*. The larvæ are so different as to be separated at a glance, the former being studded with small white tubercles, and the latter sprinkled with bristly hairs. It is little use expecting to take a series of either of these moths, while enough larvæ may be taken of either in September, and even in October in late localities, to satisfy the wants of any reasonable collector.

In drier woods than those delighted in by the swamp-loving angelica, we must search the flowers of the golden-rod in August for larvæ of *E. expallidata*, which are also said to frequent the flowers of ragwort (*Senecio*). These are apparently not common

anywhere; and it is usually considered one of the rarer members of the genus.

Perhaps the best sport of any, in collecting larvæ of *Eupithecia*, is to be obtained by beating the flowers of ragwort into an inverted umbrella. This may be conducted at any time, until the flowers have even turned to seed. The larvæ are often numerous, both as individuals and species. We may expect among the latter *E. oblongata* (*centaureata*), *E. virgaureata* (also from flowers of golden-rod), *E. absynthiata*, *E. castigata*, *E. vulgata*, and others. All these pupate in turfy mould, and should be kept exposed to all weathers in winter, but not in too damp a place.

Just before dark on evenings in July, when there is little wind, we shall find specimens of *E. succenturiata*, flying gently and gray looking in the twilight round clumps of mugwort (*Artemisia*). These are most suitable when growing on a sheltered bank, or on the lee side of a hedgerow. The larvæ are strictly nocturnal in their habits, and are said to hide by day under fallen leaves, &c, on the ground, only coming up to feed at night, when they may be beaten along with those of *E. absynthiata* in September. Very different are the habits of the larvæ of the allied (at one time supposed to be a variety of the same) species, *E. subfulvata*. These feed on the leaves of yarrow (*Achillea millefolium*), and are to be found at the end of August at rest, in the daytime, lying along the midrib on the upper side of the leaf. After finding one or two, one immediately gets the knack, and soon bags enough for a long series, which is always worth rearing, and from many localities, as this is one of the most variable of our pugs.

Eupithecia scabiosata (*subumbrata*) is a carrot-flower feeder, and the larvæ should be looked for when the wild carrot is in full flower on salt-marshes, or by the sides of our large tidal rivers. It may be swept by the sweeping net, or beaten into an umbrella in numbers. Evening is the best time to get these larvæ, as they are more active then than by daylight. The moths may be netted in June, but only sparingly in number.

E. jasioniata, one of our more recent additions to the British list of these insects, has as yet only been taken in Devonshire and South of Ireland. If the blue flowers and seed-heads of *Jasione montana* (sheep's-bit) were gathered and bagged in September, we might reasonably expect to find it in most localities where the food-plant grows.

E. plumbeolata feeds upon cow-wheat (*Melampyrum*) flowers, from middle of July to middle of August, the moth appearing in May in copses and woods where the food-plant abounds. *E. pygmæata* is a somewhat rare species, occurring in all three sections of the United Kingdom. The larvæ feed upon petals and anthers of stitchwort (*Stellaria holostea*) in June, but in captivity it has eaten the petals and stamens of *Cerastium*. The imagines fly about the middle of May. *E. campanulata* is another woodland species, feeding in August and September on the flowers and unripe seeds of the nettle-leaved Canterbury bell (*Campanula trachelium*) in a state of nature, though in captivity it will eat the seed-heads of other species of that genus, the moths appearing in the following July, but of course only in localities where the food-plant occurs.

About the middle of May we must not forget to search or beat the flowers of maple for the larvæ of *E. subciliata*, which is a "good thing" among pugs; but if worked for would probably be found in many unexpected localities. We should rear the moths in August. Another of the rarer *Eupithecia* is *E. dode-neata*, which must be looked for in May and June in large oak woods. The larvæ may be beaten from oak, but are better reared from a brood of eggs, and should be fed on young and succulent leaves.

Eupithecia togata is unique among British pugs, for its manner in which the larvæ feed. These are to be found by examining in autumn the unripe cones of spruce trees. The indication that larvæ are there is to be found by the little groups of frass which hang to the sides of the cone. When found and gathered, the cones should be placed in some receptacle, so as to stand with the narrow point downwards over some turfy earth, for the larvæ to pupate in. This is considered a rare species, but I believe it will be found wherever spruce trees are common and sufficiently high to produce large cones. A good field-glass will be found useful in examining the cones at a distance, and save much uncomfortable climbing. The moths occur in June.

The larvæ of *E. debiliata* occur early in May, feeding upon the leaves of bilberry or whortleberry (*Vaccinium myrtillus*). It spins the leaves together and resides in this tent-like home, much like the larva of the genus *Hypsipites*. The moths are found in the localities where they have been found at rest,

commonly upon tree trunks, &c., in June. It is a somewhat local species.

I have almost completed my task, but before doing so there are several remaining species of the genus which must be shortly considered, but about which little can be said. *E. pernotata* has been bred once only in England, and then by Mr. Machin, who took the larvæ from golden-rod. I am not aware that *E. egenaria* has ever been bred in this country. *E. extensaria* has only been taken two or three times near Hull, but if the *Artemisia* of the neighbourhood was worked it might be possibly found in the larval state. Of *E. innotata* I know only that larvæ are said to occur upon *Artemisia* at the same time as those of *E. succenturiata*. It is possible that some of these three species, excepting perhaps our Russian visitor, may in time disappear from our lists, and the best one can say about them is, that it would be satisfactory if they turned up in greater numbers.

It must not be thought that there are no more pugs to be found in Britain. Nothing is so likely, for there are several on the Continent, which are common enough there, that might be found in this country. So in conclusion, allow me to express the hope that some of those who may be induced by these remarks to work the genus *Eupithecia* should find not only all our British species, but even make an addition to our fauna.

Savage Club, London, W.C., April 24, 1885.

DESCRIPTION OF A NEW SPECIES OF *PIERINÆ* FROM THE MALAY PENINSULA.

By W. L. DISTANT.

APPIAS ANDERSONI, *n. sp.*

Male.—Wings above creamy white; anterior wings with the apical area—from less than midway between end of cell and apex of wing and narrowing to outer angle—blackish; neuration more or less blackish; basal half of costal area more or less shaded with greenish; posterior wings with the outer margin blackish, the neuration more or less darkened. Anterior wings beneath creamy white, costal area and apex ochraceous with a greenish tinge, the last with three obscure paler subapical spots; upper

and lower cellular margins broadly blackish, beyond cell the colour is blackish, neuration more or less blackish, the two upper median nervules darkest and connected near margin with a transverse black spot; outer margin pale blackish. Posterior wings beneath bright orange-yellow, the neuration blackish; apex of cell and two large elongate spots beyond cell pale sulphureous; apical and outer margins and a transverse fascia extending from discoidal nervule to about lower median nervule obscure olivaceous. Body above more or less concolorous with wings; abdomen beneath creamy white, thorax and legs more or less concolorous with wings.

Ex. wings, ♂, 54 millim.

Hab. Perak (Künstler).

This species belongs to the section of the genus which has been generically separated by Mr. Moore under the name of *Huphina*; it is allied to the Javan *A. nama*, Moore, and is contained in the fine collection of Perak butterflies belonging to Dr. Anderson, which has been placed in my hands for determination. *A. andersoni* will be figured in 'Rhopalocera Malayana.'

ENTOMOLOGICAL NOTES, CAPTURES, &c.

UNUSUAL ALTITUDE FOR *MELITEA AURINA*.—Referring to Mr. Sandford's note (Entom. xviii. 123) on *M. aurina* (*artemis*), my own case of discovering a locality for this species last season (as recorded vol. xvii., p. 82) is very similar. I found the insects over 1200 feet above the sea-level, on the summit of a mountain, the sides of which are thickly wooded, with occasional pieces of boggy ground on the slope, which doubtless accounted for the occurrence of this marsh-living species.—MARTIN J. HARDING; Old Bank, Shrewsbury, April 14, 1885.

LATE OCCURRENCE OF *MACROGLOSSA STELLATARUM*. (Entom. xvii. 273).—I remember noticing an example of this species flying about briskly on a winter's day,—it would be in December or January,—and other entomologists have seen it abroad during mild weather in the period of its hybernation. Like some of our butterflies of similar habit, it is occasionally tempted out by a gleam of sunshine. The spots it chooses for its hybernation do

not appear to be ascertained, but I presume the fact is unquestionable. Newman says that we may come across one at a flower any time from January to December, but there is, I think, only one brood yearly, oviposition taking place in the spring. — J. R. S. CLIFFORD; Cambrian Grove, Gravesend, December 11, 1884.

ON THE IDENTITY OF CERTAIN AGROTIDÆ.—I quite concur with Mr. Tutt's remarks (Entom. xviii. 94) as to *Agrotis aquilina* and *A. obelisca* being only variant forms of one and the same species, of which *A. tritici* is the type. Some foreign entomologists believe that *A. nigricans* is also only a form of *tritici*, an opinion which at present I am not inclined to share. However, the genus *Agrotis* seems to have been a puzzle to most lepidopterists; and in the 'European Catalogue of Lepidoptera,' by Dr. Staudinger and M. Wocke (1871), it forms a stupendous genus, only divided by letters, and containing 172 species, many of which English lepidopterists would view as distinct genera. *A. strigula*, Thnb. (*porphyrea*), commences the genus, and then is included *subrosea*, which is given as a British species only (*Anglia olim*); then follow our familiar yellow-underwings, *ianthina* in the letter D, and one other species in the E group; besides *rubi*, *umbrosa*, *dahlii*, *brunnea*, *festiva*, *cinerea*, *segetum*, *exclamationis*, *corticea*, *puta*, *nigricans*, *tritici*, *obelisca*, *præcox*, *prasina* (*Aplecta herbida*), and *occulta* (*Aplecta occulta*), &c. By the above we see that he retains as good species, *tritici*, *nigricans*, and *obelisca*, but sinks *aquilina* as a synonym of *tritici*. In Ent. Mo. Mag., vol. xix., p. 278, Mr. Warren says:—"One summer, many years ago, I beat out of some ivy, which covered the wall of a garden in the town, a great variety of Noctuæ, and amongst them numerous specimens of *Agrotis nigricans*, *tritici*, and two each of *aquilina* and *obelisca*. I remember having been much surprised at the time at the occurrence of the last two species, the examples of which I still possess." Mr. Warren then proceeds to give a translation from the 'Jahrbücher des Nassauischen Vereins für Naturkunde,' xxxiii., xxxiv., 1880-1881, p. 87. This notice is too long to give in its entirety, but the following are some extracts, from which it appears that Dr. Adolf Rössler, the author of 'Die Schuppenflügler des Kgl. Regierungsbezirks Wiesbaden und ihre Entwicklungsgeschichte,' believes *tritici*, *aquilina*, *obelisca*, and *nigricans* to be one and

the same species. "*A. tritici* is certainly the most variable of our Noctuæ in size, markings, and colour; nay, even the antennæ seem not to be quite the same in all examples. We had an opportunity of assuring ourselves on this point very completely. The devastation caused in vineyards on the frontiers of Moravia, recorded by Treitschke, in vol. x., pt. 2, p. 19, of Ochsenheimer's work, have been repeated in our neighbourhood, at Ockelheim, near Bingen, in the years 1871 and 1872, to such an extent that many individuals had their vineyards destroyed." * * * * "The larvæ lived exactly like earth-worms,—by day under ground, and by night only on the surface, in order to feed. Salad, and such-like succulent plants, are much more relished by them than the tenderest shoots of the vine. Dr. Pagenstecher reared a large number of the larvæ with the same results as myself. * * * * Among the large number of examples reared in the course of these broods, there were those figured by Hübner,—as *fumosa*, fig. 153; *aquilina*, 135; *obelisca*, 123; *fictilis*, 479 and 710; *unicolor*, 544; *erata*, 623; *carbonea*, 700; *praticola*, 567; *vitta* and *aquilina*, 533–35; *ruris*, 416; besides the following figured by Herrich-Schäffer,—*adumbrata*, 121; *rustica*, 495; *fumosa*, 526; *tritici*, 527 and 552; *obelisca*, 529 and 553. All were plentifully represented, and it could not but be that all belonged to one and the same species, united as they were by numerous intermediate forms." Like Mr. Tutt, I have seen all kinds of varieties on the sand-hills here. Moreover, I am sure the genus *Agrotis* is not the only genus in our Lepidoptera which wants careful revision; and, in my opinion, especially the genus *Zygæna*, F., of which the identity of some of the species will in time be proved, many of the species in our Catalogues now being extremely doubtful, and requiring a thoroughly scientific investigation.—C. G. HALL; 7, Beaconsfield Road, Deal, April 6, 1885.

ON THE IDENTITY OF CERTAIN AGROTIDÆ.—This is by no means a new question, for in January, 1842 (Entom. vol. i. p. 254), under the title of "Observations on Species and Varieties," Mr. W. Bentley discusses it at considerable length, and after describing the points of difference between *Agrotis nigricans*, *fumosa*, *ruris*, *dubia*, and *obelisca*, says, "The vast numbers of specimens I have examined, varying from dingy black to light red, with all intermediate grades of character, have convinced me that they all constitute but one inconstant species." In the same

manner he groups *tritici*, *vitta*, *pupillata*, and *ocellina*. Mr. Bentley was just as near to the truth nearly half a century ago as we appear to be now.—JOHN. T. CARRINGTON; April, 1885.

PAIRING OF LEPIDOPTERA OF DIFFERENT GENERA.—Whilst out collecting on the night of March 25th, with two fellow-entomologists, I noted what seems to me an unusual occurrence:—On the trunk of a beech tree was the male of *Hybernica marginaria* (*progemmaria*) coupled with the female of *Tephrosia crepuscularia*, and at the same time there were no less than four *marginaria* (males) crawling round and over the pair. The female *crepuscularia* was a small specimen of that species.—T. B. JEFFERYS; Clevedon, March 26, 1885.

MIMÆSEOPTILUS SCABIODACTYLUS.—Mr. South, in describing the larva of *Mimæseoptilus* (Wall.) *scabiodyctylus* (*mihi*), unwittingly no doubt leads us to think (Entom. xviii. 98) that this plume larva has a “dorsal stripe reddish pink (or rose-madder), most distinct on the 9th to 12th segments,” when full-fed. May I say that larvæ of *M. scabiodyctylus*, when full-fed, have no pink upon them, or only so little that I have failed to see it? The larvæ from Folkestone, which “fed upon scabious,” may possibly be *scabiodyctylus*, but if they are like mine in the larva state then they certainly are not the same species as he calls *plagiodyctylus*, because, as he quotes me on the same page, *plagiodyctylus* (Stainton and Millière) has a broad, distinctly defined and distinctly pronounced rich claret-coloured dorsal stripe through all its larval life, and feeds upon the devil’s-bit scabious (*Scabiosa succisa*) in this country, eating into the central unopened leaves, when young, in May, and afterwards eating the radical leaves. The second brood feeds upon the leaves in August, and appears in September and on into October, whilst *scabiodyctylus* feeds upon *Scabiosa columbaria* in March and April, and is on the wing in June and July; but as yet I never knew a second brood of it. When young the larva is hirsute; the dorsal region is suffused with lightish pink, as seen through the rather dense hairs. Each change of skin reduces the colour of the pink streak, until, as I said before, the larva has no pink upon it when full-fed, whilst the larva of *plagiodyctylus* of Stainton retains its broad dorsal claret-coloured stripe to the moment of pupation. This will be seen in the figure of it in

Millière's 'Iconograph of New and Little-known Lepidoptera,' but Mr. South, on page 99, absolutely describes *plagiodyctylus* larva taken by himself in July, when, so far as I know the habits of *scabiodactylus*, no larva of the species could be in existence at that time. In proof of how little was known until recently of the life-history of this plume, and that even now we do not know much, I may say that Zeller, in 1841, called Haworth's *bipunctidactyla*, *serotinus*; and a variety of it he called *microdactylus*. Then Stainton called it *plagiodyctylus* in his Supplementary 'Catalogue' and in his 'Manual,' as did Millière; and again, Zeller christened it *aridus*, 1847-50. And now our good friend Mr. South says I have christened it *scabiodactylus*. That is not so; I have differentiated the larvæ of both species, and figured them, finding *scabiodactylus* is not any of the above, but a most distinct species, nearly allied to *pelidnodactylus*, Zell., but not so large as that species. Then Mr. South tells us that his series of *gonodactylus*, Sta., varies very much. May not some of these be *P. farfara*, Zell., a smaller, redder, and darker species than Mr. South's *gonodactylus*, and more like *zetterstedti* in colour and marking? We have a coltsfoot-feeding larva in Wales, in June, which makes a gallery through the fluff on the underside of the leaf. Can this be the larva of *P. farfara*, Zell.?—C. S. GREGSON; Liverpool, April, 1885.

ATTRactions FOR LEPIDOPTERA.—The following extract from the 'Bulletin' of the Brooklyn Entomological Society for December, 1844 (vol. vii., p. 105), may be of interest to some readers of the 'Entomologist':—"Dr. Holland stated that the burning gas-well near Pittsburgh illumined the country for miles around, and insects were attracted by the thousands, so that a circle of scorched insects was each morning to be found. Among them were many large Bombycidæ, principally males. Over 100 male *Saturnia io* were found one morning. He fears this may eventually cause the destruction of the larger Bombycidæ in that vicinity. The larva of *io*, else common enough, is this season extremely rare. At an electric light a large number of very good species had been taken. Mr. Græf related the experience of some collectors, who threw a powerful light against a white sheet, giving a large white surface, which proved very attractive. Mr. Smith related his practice in the Catskills, pulling down a thin white blind to an open window, and setting a

lamp behind it. The insects flew to the white surface, found their way into the room around the edges, and quietly settled about the walls, where they were taken next morning. Mr. Schwensen had often noted the attraction of an electric light, near the Central Park, to Coleoptera. Carabidæ, and especially *Harpalini*, came in considerable numbers. Dytiscidæ and Hydrophilidæ only when the wind was favourable, *i.e.*, from the Park lakes. The attraction of sugar to insects was then brought up, and Mr. Claggis, who had collected during the past season in the Isle of Jamaica, gave the result of his experience. Sugaring trees was without result. The flowers exercised a superior attraction. Flowers were so abundant that collecting at them was tedious, so he tried sugaring flowers, with complete success. The flowers artificially sweetened swarmed with insects, while the others were deserted. Large Bombycidæ came to this bait that never came to sugar on trees."—W. W. FOWLER; Lincoln, April 15, 1885.

MYELOIS CERATONIE.—At Christmas time I found a larva feeding in sweet almonds, which on March 18th produced a fine specimen of the above species.—GEO. COVERDLE; 24, Fleming Road, Lorrimore Square, E.C., April 24.

ICHNEUMONS BRED, OTHER THAN FROM LEPIDOPTERA.—*Hemiteles castaneus*, Tasch., 13th April, 1882, from *Trichiosoma betuleti* (sawfly cocoon). *Orthopelma luteolator*, Gr., 30th May, 1882, from *Aulax hieracii* gall, on *Hieracium umbellatum* (narrow-leaved hawkweed); and 11th June, 1884, from *Rhodites rosæ*, rose Bedeguar. *Hemimachus instabilis*, Först., 23rd August, 1882, from *Cionus scrophulariæ* (pupa of the beetle). *Limneria curvicauda*, Holmgr., 11th October, 1884, from *Nematus gallicola*, sawfly galls, on *Salix viminalis*, gathered 25th August. *Euryproctus nigriceps*, Gr., 11th June, 1881, from *Trichiosoma betuleti* cocoon. *Mesoleius sanguinicollis*, Gr., 10th September, 1884, from galls on *Salix caprea*. *Pimpla brevicornis*, Gr., from pupa of a beetle. *Bracon lævigatus*, Ratz., 26th August, 1884, from *Nematus gallicola* galls on *Salix viminalis*.—G. C. BIGNELL; Stonehouse, Plymouth, March 14, 1885.

ERRATA.—Entom. vol. xviii. p. 89, line 1, for *Sphinx cassinea* read *Asteroscopus sphinx* (*cassinea*); p. 95, line 7, for *Gnophra* read *Gnophos*; and p. 123, line 7 from bottom of page, for *Procris ino* read *Ino statices*.

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LIFE-HISTORY OF *LIOTHULA OMNIVORA*.

BY GEORGE VERNON HUDSON.

THE larva of this moth may be found throughout the year on the foliage of various trees, the favourite among the indigenous kinds being the common manuka (*Leptospermum*). In cultivated parts of the country, where a great many of the coniferous pines (*Cupressus macrocarpus*, *Pinus insignis*, &c.) have been introduced, it is to be found feeding on these quite as freely as on its original food-plant; it also shows great partiality for willows. When very young, and probably immediately after leaving the egg, this larva constructs a wide spindle-shaped case, principally composed of silk, only a few small fragments of leaves, &c., being attached to its outside; it has a large aperture in front, through which the head and anterior portion of the larva are projected, and a much smaller one at the posterior extremity, which allows the pellets of excrement to fall out of the case as they are evacuated. The enclosed caterpillar is of a light straw-colour, the head and first three segments being dark brown and hardened, with their anterior margins shining white; legs brown. The abdominal segments are considerably thickened near the middle of the insect, rudimentary prolegs being present on the 3rd, 4th, 5th, and 6th segments of the abdomen. The anal prolegs are very strong, and are furnished with numerous sharp hooklets, which retain the larva very firmly in its case. As it grows it increases the length of its domicile from the anterior, and causing it gradually to assume

a more tubular form, tapering towards the posterior aperture, which is enlarged from time to time. The outside is covered with numerous fragmentary leaves and twigs of various sizes placed longitudinally on the case, and frequently there are green pieces near the anterior aperture, which the larva has recently selected and joined on. The interior is lined with soft smooth silk of a light brown colour, the thickness of the whole fabric being about the same as that of an ordinary kid-glove, and so strong that it is impossible to tear it, or indeed to cut it, except with sharp instruments. The size of the case when the caterpillar is mature varies considerably, ranging from twenty-five to thirty lines or more in length, and about three in diameter, the widest portion being a little behind the anterior aperture.

During the day the larva spins a loop of very strong silk over a twig, the ends being joined to the upper edges of the case on each side; in this way it hangs suspended, the caterpillar lying snugly within. I have often known a larva to remain thus for over three weeks without moving, and afterwards resume feeding as before; this probably occurs while the inmate is engaged in changing his skin, the cast-skin being most likely ejected through the posterior aperture of the case.

At night the larvæ may be seen busily engaged: they project the head and first four segments of the body beyond the case, and walk about with considerable rapidity, often lowering themselves by means of silken threads; the only locomotive organs are of course their strong thoracic legs, which appear to easily fulfil their double function of moving both larva and case. If disturbed these insects at once retreat into their cases, closing the anterior aperture with a silken cord, which is kept in readiness for the purpose, and pulled from the inside by the retreating larva. This operation is most rapidly performed, as the upper edges of the case are flexible, and thus fold closely together, completely obstructing the entrance.

From the case I will now turn to the description of its inhabitant. The chief peculiarities of the young larvæ have been noted above; what follows consequently refers to the full-grown caterpillar. The head is moderate in size, of a light yellowish colour, covered with a number of minute black specks; the first three segments are white, very smooth and shining, with a dark brown dorsal line and a large lunate spot, similar in

colour, on the posterior margin of each at the side; there are also numerous small blackish dots, which become denser on the ventral surface; the legs are dark brown, and very robust. The abdominal segments are smaller than the preceding; the first dull brick-red in colour, with an obscure brownish band in the centre; the rest are of a uniform dull brown hue, almost black, they are much wrinkled, especially on the under surface; prolegs situated as in the young larva, but much smaller in proportion. Length from thirteen to twenty lines.

The individual I extracted in order to make the above description evinced an intense dislike to the operation, retreating to the extreme end of his case, and clinging firmly with his anal legs; when, however, the whole of one side was cut out he was forced to give up possession, and a more helpless insect than the naked larva can hardly be imagined. As soon as I had finished with him I put him back in his old case, which he completely repaired in a few days, the new material with which the larva had filled in the slit down the side being plainly visible, leaving a curiously mended appearance.

These larvæ can endure long periods of starvation. I once found a specimen which had been left in a box for four months without food, having been forgotten. It was very small and shrivelled, but still alive, although I think it subsequently expired.

When full-fed this caterpillar fastens the upper end of its case to a branch with a loop of strong silk, which is drawn very tight, preventing the case from swinging when the plant is moved by the wind, and also rendering the insect's habitation more inconspicuous by causing it to resemble a broken twig. The anterior aperture is completely closed, the loose edges being drawn together and fastened like a bag. The posterior end of the case is twisted up for some little distance above the extremity, thus completely closing the opening there situated. It is lined inside with a layer of very soft silk, spun loosely over the sides, and partly filling up each end. In the centre of this the pupa lies with its head towards the lower portion of the case, the old larval skin being thrust backwards amongst the loose silk above the chrysalis.

In this stage of existence the extraordinary sexual disparities which are so characteristic of the family manifest themselves,

the male and female pupæ being very widely different in all respects. The male pupa is elongate and somewhat attenuated, especially in the abdomen; the head and eyes are moderately large, the antennæ-, leg-, and wing-cases being very conspicuous. The thorax is broad and well developed, and the abdomen tapers slightly towards the apex; it has seven visible segments, the last being flattened dorsally, and provided with a small sharp spine on the ventral surface close to the extremity. In colour the pupa is dark chestnut-brown, inclining to black on the head and wing-cases; the posterior margins of the abdominal segments are black, the terminal ones being lighter than the rest; there are also a few obscure yellowish spots on the breast of the pupa. The edges of the posterior articulations are furnished with a double row of very fine but stiff bristles on the dorsal surface. Length about seven lines. The female pupa is much larger and cylindrical in shape, the abdomen occupying nearly the whole of the body; it possesses nine visible segments, the terminal one being obtusely conical. The head and thorax are very rudimental, more resembling those of the larva than the male, all the appendages being, however, reduced to hardly visible warts. In colour it is pitchy black and shining, the head and thorax being obscurely cinereous, and the two terminal divisions of the abdomen ruddy yellow; the edges of all the segments on the dorsal surface are slightly dentate. Length about ten lines.

This insect remains in the pupa state during the summer months, *viz.*, from May till September. When about to emerge, the male chrysalis works his way down to the end of the case, forcing open the old aperture there, and projecting the head, thorax, and upper portion of the abdomen, the pupa being secured from falling by the spines on its posterior segments, which retain a firm hold in the silk. The anterior portion then ruptures, and the moth makes its escape, clinging to the outside of its old habitation and drying its wings. It is probable that the female insect does not leave her case, communication with the male being no doubt effected through one of the orifices, and the eggs afterwards deposited inside.* On one occasion I found a case full of eggs, containing the shrivelled body of the female

* For details of copulation and figures of genitalia in the allied American bag- or basket-worm (*Thyridopteryx ephemeraformis*, Haw.), see Riley's description in *Sci. Am.*, Suppl., April 3rd, 1878, and *Proc. Bi. Soc. Washington*, ii., pp. 80-83.—E. A. F.

and her old pupa-shell, which would seem to confirm the above opinion. In colour the male is of a uniform blackish brown, becoming darker on the body, and lighter near the middle of the front wings, each of which has an obscure rusty brown spot near its hind margin; all are very sparsely covered with scales, the posterior pair being semitransparent. The antennæ are heavily bipectinate at their bases, becoming quite simple at the tips. The expansion of the wings is eight lines.

The female has a great superficial resemblance to a large maggot; the head and thorax are very small, the legs being extremely minute, and much resembling those of the larva in structure; they are of no use in walking, the insect being incapable of locomotion, or indeed movement of any kind, except a slight twirling of the ovipositor, which takes place when the eggs are being laid. The antennæ are in the form of two minute papillæ, apparently without articulations, projecting from each side of the head. The abdomen is very large, and the divisions are somewhat obscurely indicated; at its extremity it is furnished with a slender two-jointed ovipositor, the basal joint being twice the width of the terminal one; above this is situated a thin tuft of straw-coloured scales, and there are also a few scattered ones of the same colour on the anterior portion of the insect and about the legs. Colour uniform dull yellow, the head and prothorax slightly corneous and dark brown. Length ten lines. This creature is of such a soft consistency that it becomes quite flat when placed on a hard level surface, which offers it no support.

Of the habits of the imago in its natural state I am quite ignorant, as all the specimens I have ever seen were reared in captivity from cases containing either larvæ or pupæ; and as its discoverer, Mr. Fereday, of Christchurch, obtained all his examples in the same way, it would appear to be very rarely met with in the open.

Notwithstanding the strong case that protects this insect during its preparatory stages it is very susceptible to the attacks of dipterous parasites; in fact it is so frequently infested that I am sure quite three out of four of all the cases I have opened have contained dipterous pupæ. The numbers found in each individual vary considerably; generally there are about six, but as many as fourteen or fifteen frequently occur in very large

caterpillars, while the much smaller larvæ of the males sometimes contain but a single parasite. These pupæ are dark chestnut-brown in colour, with distinct articulations; their length is nearly three lines, and they are of the ordinary coarctate form. The perfect insect is a brilliant green fly, the abdomen being almost blue; the scutellum is bordered with fulvous, and the legs are black; the whole insect is also covered with numerous black bristles; its length is about three lines. A description of this fly may be found in the 'Catalogue of New Zealand Diptera,' where it is described for the first time under the name of *Eurigaster marginatus*.

Among a large number of the exuviae of this species I found one which had not emerged. Knowing that all the individuals of a single brood of dipterous insects always appear within a few hours of one another, I was anxious to ascertain what had occasioned the protracted emergence of this specimen, and in order to do so I enclosed it in a small tightly-fitting box. On examination about ten days afterwards I discovered eighteen small Chalcids had escaped through a small round hole near its anterior end; four of these are considerably smaller than the rest, but do not differ in any other respects, and are no doubt males.

Owing to my very imperfect knowledge of the New Zealand Hymenoptera, I think it would be useless for me to attempt to describe an obscure species of this kind at present. I therefore enclose specimens, should they at any time be required, and leave the description to someone who is better able to perform the task than myself.*

I have not yet been able to ascertain how the Chalcid introduces its eggs into the Dipteron; nor is it likely to be discovered, except by the most minute observation. It is certain that a full-grown maggot would not suffice to nourish eighteen Chalcid larvæ, which collectively equal it in bulk after it had ceased feeding; hence it is evident that the eggs are not deposited in the dipterous larva when it has left the caterpillar. If, on the contrary, they are introduced into the maggot while it is within the *Liothula* larva, the hyperparasite must either promiscuously deposit in every caterpillar it comes across all the

* Two specimens of this *Pteromalus*, and a third partially destroyed, are deposited in the British Museum.—E. A. F.

eggs, except those which reach a dipterous maggot never hatching, or it must by some extraordinary means be able to single out those caterpillars infested by Diptera and oviposit in them, occasionally perhaps missing the maggots lying within, as Mr. Bignell conjectures in the case of *Abraxas grossulariata* (Entom. xiii. 245). Both of these suppositions are, in my mind, contradicted by the fact that out of six dipterous pupæ taken from a single caterpillar only one was infested with Chalcids, and that contained eighteen. Now it would be a remarkable circumstance indeed for a female Chalcid to oviposit in a caterpillar eighteen times, striking an enclosed maggot every time, and not any of the five others once. I prefer to consider, until actual observation proves it fallacious, that both *Eurigaster* and the Chalcid enter the *Liothula's* case together by the posterior aperture, the latter possibly clinging to the former. The Dipteran then lays a number of eggs on the skin of the caterpillar, as is the case with all parasites of the order, and the hyperparasite oviposits in one, or perhaps occasionally more, of these; the dipterous maggots then eat their way into the caterpillar, both insects afterwards developing, as we have seen above.*

This theory may of course be upset at any time by the discovery of the actual method; but, with the facts at present at my disposal, I think the above is the most feasible explanation, and, moreover, that it is not without a parallel in the insect world anyone will admit, who is acquainted with the life-history of the genus *Sitaris* among the Coleoptera.

Karori, Wellington, New Zealand, March 25, 1885.

* Sir Sidney Saunders met with a similar difficulty in the case of a *Chalcis* hyperparasitic on a *Sarcophaga* living within the body of a locust (*Ædipoda cruciata*, Charp.). He says, "Hence the question arises, how the parent *Chalcis* obtained access to the *Sarcophaga* larvæ for the purpose of depositing her eggs? It might be supposed that this opportunity was afforded at the time when the adult larva quits the body of the locust to undergo its final metamorphoses in the earth. But such could not have been the case in this instance, when the transition took place within a closed box remote from their accustomed haunts. The egg must therefore have been deposited at an antecedent period, either while the larva was within the body of the locust, or probably still earlier, when the newly-hatched larva was about to penetrate into the body of the locust." (Proc. Ent. Soc. Lond., 1881, p. xxv.)

FRUIT *versus* SUGAR.

BY GEORGE BARNARD.

It may serve to amuse some of your readers to know how we catch moths on this side of the world, using fruit instead of sugaring; so I will give a slight sketch of our proceedings towards the end of January, 1885. We had had heavy rains and hot steaming days, all vegetation was running a mad race, and such fruit as we can grow here was ripening apace. With the hot steaming days came innumerable butterflies,—for years past there has been nothing like it, the Whites and Yellow, *Catopsilia*, *Pieris*, and *Terias* being most prominent.

Seeing such a profusion of Rhopalocera made one suspect that moths might be equally numerous, so we began our traps in this way. Having gathered half a dozen ripe bananas, we hung them in separate places about the garden. About half an hour after dark we began our rounds, lantern (bulls'-eye) in hand. The first we came to had one large moth, *Ophideres fullonica*, hanging to it, but, as it was not a good specimen, it was allowed to remain. On the others were sometimes two and even three. The best were selected and captured in this way:—A large prune-bottle, charged with cyanide of potassium, was quietly held under the moth, and, if the fumes were not sufficiently powerful to cause the insect to drop, the cork was brought down and the moth forced into the bottle; after a few moments it was taken out and pricked with oxalic acid (for which hint I am indebted to the 'Insect Hunter's Companion.') And so we went on, getting another species or so occasionally, notably *O. imperator*; but the first few evenings being dry and comparatively cool and windy moths did not put in a numerous appearance. But then came a change. A slight rain came on for the next three days, the evenings being misty and warm. At night moths became as numerous as butterflies by day; and our enthusiasm was excited to the highest pitch, for on each banana three, four, and even six, grand moths were hanging, jostling each other to get at the juice, and on some figs just ripening and burst with the wet were countless moths, a sight to be remembered; they were actually in clusters, and of many species. Besides those mentioned above were *O. materna* and *O. salaminea*, two species of *Hulodes*,

and other large Noctuids measuring from two to three inches across the wings, of the names of which I am quite ignorant,—probably some are new,—and a host of smaller ones, amongst which the most conspicuous was *Homoptera ustipennis*. A peculiarity about this moth is that out of twenty specimens no two may be alike. It was a puzzle which to take, they all seemed so good; however, my sons worked away at them till late at night, and at last had to desist from sheer want of room; every available box being filled, much to our disgust, as we were so greedy, it being a disappointment to see the moths and not be able to preserve them. However, we set by a good series, for it is not often such a grand display of insect-life occurs here.

The strange fact of all this is that it happens after a severe drought of two successive seasons, wherein insect-life was scarcely seen, and trees and shrubs in many places had died out. Did the few survivors breed quickly and numerous after the first rains in November, the surroundings being favourable to a quick growth? I consider the smaller moths were attracted to the juice oozing from the figs, &c., and that the *Ophideres* have the power of piercing the rind of any of the ordinary fruits, as they are often seen on oranges, and the fruit-growers of Rockhampton loudly proclaim against them. The chief mischief to oranges is caused by a small fly, which pierces the rind with its ovipositor and deposits its eggs. The maggots feed to the interior, when the orange drops off. As a trial I hung up a nearly-ripe banana, and, after watching the moths for some time, took it down, when three or four small punctures were easily seen, the juice already beginning to ooze from them.

Such was our collecting in a few evenings in January. We have always considered March the very best month for Lepidoptera, the last brood being then out; so perhaps we shall have to use the cyanide bottle again, it may be with equal effect. I have tried sugaring, but, beyond drawing multitudes of ants and some other noxious beasts, nothing came to it.

Coomooboolaroo, Duaringa, Rockhampton, Queensland, Feb. 23, 1885.

CONTRIBUTION TO THE LIFE-HISTORY OF
TRIGONOPHORA FLAMMEA.

BY FRANCIS C. WOODBRIDGE.

In October of last year I was fortunate enough to obtain a batch of eggs of *Trigonophora flammea (empyrea)*, and although I have to record a failure this time, perhaps some of your entomological readers may nevertheless be interested in knowing my experiences as far as they go.

The ova were deposited about the middle of October, and were of a conical shape flattened at the base; the ground colour was buff, and they had a dark-brown spot at the apex and a ring of the same hue running around them half-way between the apex and the base. Shortly before hatching out, which happened on the 8th, 9th, and 10th December, the ova changed colour and became grey all over.

Though I supplied the young larvæ with food of various descriptions, they seemed to prefer the *Ranunculus bulbosus*, and in fact would touch nothing else. When the young larvæ first emerge from the ova they are of a dark shade of green and hairy, or rather, I should say, fluffy. When disturbed they suspend themselves on silken threads from the leaves on which they happen to be feeding. They were about one sixteenth of an inch in length, and the prolegs, not being perfect, humped up somewhat after the style of a Geometer when moving about.

On the 20th December the larvæ had passed their first moult, and were about a quarter of an inch in length, and of a shining dark green, but they had lost their fluffy appearance, being covered with short hairs, and were more or less speckled with black.

Here, however, my first misfortune overtook me, for having neglected when changing their food to insert a piece of paper between the top of the jam-pot, which formed their abode, and the glass which covered it, all the larvæ but three during the night effected their escape.

On the 1st February the three survivors again moulted, and appeared in a bright green costume with a whitish longitudinal stripe on each side, running along just beneath the spiracles, the ground colour being of lighter shade below these lines, and the

head and legs being of a faint brown. The larvæ were still covered with fine short hairs, and appeared to have all their prolegs perfect. When disturbed they roll up in a ring and fall from the leaves. Having ascertained that their food-plant was *Ranunculus ficaria*, I supplied them with this, but they seemed at first to prefer *R. bulbosus*, though eventually they became used to *R. ficaria*, and then would not eat *bulbosus*.

There was probably a moult between the 20th December and 1st February, but as I was away from Lewes between those dates I had no opportunity of watching the larvæ.

On the 19th February the larvæ were again moulting, and on the 1st March were still of a green colour, though darker than before their moult, with five whitish longitudinal lines, one being along the centre of the back (dorsal), one on each side beneath the spiracles, and the remaining two (sub-dorsal) on each side, half-way between the dorsal line and the spiracles. There were also two white spots on each side of every segment except the head and second segment, situate between the dorsal and sub-dorsal lines. The hairs had almost disappeared, but could still be seen if the larvæ were held up to the light.

The next moult took place between the 18th and 28th March, the larvæ afterwards being of a dingy green, with numerous white speckles and spots, the most conspicuous being the two before mentioned, and a white one behind each spiracle. The whitish hues had given place to dull green ones, those on each side below the spiracles being the most distinct and lighter than the others.

There are also numerous indistinct wavy lateral lines of various shades of green covering the larvæ, but they are scarcely visible.

The larvæ moulted again between the 3rd and 14th of April, and after this moult their general appearance is brown, with a green tinge. There is a darker brown diamond-shaped mark on the fifth and following segments, stretching across the back of the larva. The head is brown, and the second segment is brown, with two dark-brown rectangular marks, with two white spots on each, the marks being divided by a short whitish streak. The third and fourth segments have a line of four white dots circling over them, whilst the remaining segments have four white spots, one being on each side about the middle of the

segment at the lowest angles of the diamond-shaped marks, and one on each side of the diamond-shaped marks half-way between the before mentioned spots and the angle nearest the head. There are also two parallel rows of white spots on each side of the larva, one in the same line with the spiracles, and the other a little above. A darker band of brown runs along the back. The ground colour is greenish brown, beautifully marked and marbled, above the spiracles, with numerous dark brown or black wavy lines. The legs and underneath parts of the larvæ are of a pale pea-green without markings.

Feeding only took place at night after the third moult, the larvæ hiding themselves during the day at the bottom of the jar in which they were kept.

After the moult in April, as the larvæ did not seem to care much about either *R. bulbosus* or *R. ficaria*, I gave them some privet, which was just then coming into leaf, and which grew abundantly in the locality where the imago is found. They immediately commenced feeding on this, and were nearly two inches in length, and I should say almost full grown, when a lady visitor, impelled no doubt by the proverbial curiosity of the sex, proved fatal to two of them, thus leaving me one survivor only. This survivor I put in a tin box with some earth at the bottom, and on the 1st May it disappeared. Of course I thought the larvæ had burrowed, but on searching the mould a few days later I could not find it. Whether female curiosity was also to blame I do not know. The larvæ in the various stages afforded rather a striking example of imitation of the plants on which they fed. In its green forms, its general ground colour, with the white spots and lines, it gives a good resemblance to the leaves of the pilewort, the white spots giving it the appearance produced by the reflection of the sun's light on the shining surface of the leaves, and the brown colour of the larvæ after its last moult giving a good imitation of the stems of the privet. I may add that my larvæ after their third moult were kept in a greenhouse, though without any artificial heat. The larvæ will also feed on ash.

Lewes, Sussex, May 23, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

CHÆROCAMPA CELERIO AT BERKLEY.—In November last a young man brought me a specimen of *Chærocampa celerio*, which he said he had found on the pavement in this town one evening, just as it was getting dark. Is not this a late occurrence for this rare and handsome species? — JAMES BORER; High Street, Berkley, May 19, 1885.

NOTE ON CERTAIN AGROTIDÆ.—In reply to Mr. Tutt's question (Entom. xviii. 94) relative to the identity of *Agrotis tritici*, *A. aquilina*, and *A. obelisca*, as an old entomologist who knows the larvæ of these three species, I can say, for the information of any who do not, that they cannot well be mistaken for one another. Thus *A. tritici* larva is about an inch and a quarter long, cylindrical, with the ends reduced, dirty, colourless, grub-like, slightly glaucous, with hardly any markings; when just changed is dirty glass-like; it can always be found upon our sandy coast lands, wherever *Cerastium* grows, buried at the roots, in May. *A. aquilina* larva is an inch and a half long, cylindrical, slightly reduced at second and last segments; this is more striped than are the larvæ of the genus *Agrotis* generally; sometimes these stripes are very faint on the dorsal region; the broadest stripe is on the side, below which is another broad stripe, dark, dirty greenish above the spiracles. *A. obelisca* is fully an inch and a half long, thickly cylindrical, having a broad dorsal streak of rich purplish brown, almost covering the back when seen from above. I took and bred upwards of fifty when last in Ireland; they are very fine, well-marked specimens. I got them by clearing all the vegetation and soil off the whole face of a slightly stratified rock in Dublin Bay, stripping ledge after ledge from the bottom upwards, securing one larva for every one or two square yards worked. The tide washed the base of the rocks. As regards the Shetland forms of so-called *A. cursoria*, all which I have seen have turned out to be *A. tritici*, not one *A. cursoria* amongst them. Mr. Tutt's illustrations of *Gnophos obscuraria* and *Boarmia repandata* do not apply, as they are more geological than geographical varieties. I can take the former of almost any chosen shade around here, by deciding where to work—even within a short walk on to another geological

formation. Those from Wallasey are always ochreous; while two miles away, across a marsh, on Bidston Hill, they are rich satin-like in texture, and almost black in colour; but at Llanferris, sixteen miles distant, as the crow flies, they are almost as blue as *Agrotis ashworthii*. In reply to the enquiry whether *Agrotis similans* (*pyrophila*) still occurs in Great Britain, I have pleasure in saying that it may be taken in Lancashire, Westmoreland, Cumberland (where I took it recently), in Cheshire, Flintshire, and in Denbighshire, where I caught the species last season. —C. S. GREGSON; Rose Bank, Fletcher Grove, Edge Lane, Liverpool, April 20, 1885.

ON THE IDENTITY OF CERTAIN AGROTIDÆ.—If your correspondent Mr. Tutt had ever bred *Agrotis tritici* and *A. nigricans* he would never have come to the conclusion that they at all events were one and the same species, the larva being abundantly distinct, and also feeding attached to different plants. I find *nigricans* here generally about the roots of sorrel, and of *tritici* on the sand-hills at the roots of *Galium*, though it may also be found at the roots of grass and other plants, but I have never found it about sorrel. It is a much darker and more robust larva than *tritici*, and more resembles that of *Agrotis segetum*; and I apprehend no one will think of making out *nigricans* and *segetum* to be one species, seeing that *segetum* feeds up in the autumn and pupates early in the spring; whereas *nigricans* does not feed up until the end of May or early in June. *Tritici* larva is exceedingly like *A. vestigialis* (*valligera*) larva; they feed together; and I have reared both species without having discerned any difference in the larva, and I apprehend no one will want to make out that *vestigialis* and *tritici* are one species. All this satisfies me that no importance whatever needs to be attached to the results chronicled by Dr. Adolf Rossler and Dr. Pagenstecher of the insects reared from the swarms of larvæ at Ockelheim, seeing that most of the under-ground-feeding larvæ of Agrotidæ have a strong family resemblance, and in such a swarm of larvæ it is hardly likely minute differences would be noted. I, however, intend this year to rear and carefully describe the larvæ of *tritici*, *vestigialis*, and *nigricans*, and put beyond question the fact that *nigricans* is a true species, and no variety of *tritici*. We take both species here, but never have any difficulty in discriminating between the two; nor do we ever take *A. obelisca* or *A. aquilina*. Probably many so-called

aquilina and *obelisca* are only *tritici*, which would account for the doubt expressed as to whether *aquilina* and *obelisca* were true species, or only varieties of *tritici*.—J. GARDNER; Darlington.

ON THE PROBABLE IDENTITY OF CERTAIN AGROTIDÆ.—I have just read with interest the remarks on this subject in the last issue of the 'Entomologist' (Entom. xviii. 148), and I should not be surprised if the genus *Agrotis* undergoes considerable revision at no distant date. Of *A. obelisca* I can say nothing, as I have never taken it; but last year I worked the flower-heads of marram-grass (*Psamma arundinacea*) at night for various Noctuæ, and thus obtained several species of *Agrotidæ*; but by far the most abundant of them all was *A. tritici*. Here this species, as in most places, is immensely variable. A fair number of *A. aquilina* and *A. nigricans* were also taken in the same way; and I noticed all three varieties copulating freely with each other. One *A. obscura* (*ravida*), and several *A. vestigialis* (*valligera*) and *A. cursoria*, also fell to my lot; but in no case did I observe any of the last-mentioned species in copulâ with *A. nigricans*, *A. tritici*, or *A. aquilina*.—EDWARD A. ATMORE; King's Lynn, Norfolk, May 6th, 1885.

EUPHASIA CATENA NEAR NOTTINGHAM.—Some years ago I wrote to you with reference to a remarkable Noctua, which I saw in 1878 in the collection of an engine-driver at Nottingham, and which I was then quite unable to identify. I had almost forgotten the circumstance, when one day, turning over casually the first volume of 'Humphreys and Westwood,' I came upon the figure of a moth (in plate 54) which I at once recognised as the identical insect. Referring to the index attached to each plate, I found that the "distinguished stranger" was described as "*Euphasia catena*, the Brixton beauty." The collector, in whose boxes I saw it, informed me that he had himself taken it in a lane near Nottingham; and, from the little store he seemed to set by it, I feel pretty confident that this is a true account of the matter. The species seems to be absent from all our recent lists.—(Rev.) CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, Feb. 7, 1885.

[Appended is the letterpress describing the figure above alluded to:—"Euphasia catena, Sowerby. This species measures $1\frac{1}{2}$ inch in expansion of the fore wings, which are white, with a brown and grey spot, crossed by three pale lines near the base

and towards the costa, a triangular spot of the same colours in the middle of the costa, and the apical margin is lilac, yellow inwardly, and a row of white dots, with lilac centres, forming a chain; cilia yellowish lilac; hind wings white, with the margin slightly brown on the outer angle. A single specimen, taken by Mr. Plumstead, at Brixton, about forty years since (about 1793, Ed.), and now in Mr. Curtis's cabinet, is the only authority for the introduction of this fine insect into our indigenous lists. Boisduval regards it as a native of America, and as probably belonging to his genus *Eudryas*. It is omitted by Mr. H. Doubleday from the list of British Noctuæ." Wood, in 'Index Entomologicus,' figures it at plate 17, fig. 424a, and says, "native of India." Dr. Staudinger omits it from his European list. *Euphasia catena* may be ranked as an "accidental visitor" to this country, probably introduced in earth surrounding some plant imported from abroad.—Ed.]

TÆNIOCAMPA LEUCOGRAPHA NEAR TUNBRIDGE WELLS.—Whilst staying at Groombridge, near Tunbridge Wells, last month, I took a very fair specimen of the above-named insect whilst working some sallows.—W. H. BLABER; Beckworth, Lindfield, Sussex, May 24, 1885.

HERMAPHRODITE LEPIDOPTERA.—On August 17th, 1880, I captured a Geometer larva crawling on a fence at Herne Hill, near London, evidently in search of a suitable place to undergo its transformation. Being desirous of rearing the insect, I placed it in a box with some elm leaves, and on looking at it two days afterwards I found it had changed into a bright green pupa within one of the leaves which it had rolled up. On September 4th the moth appeared, having the wings and antennæ of the right side completely male, those of the left female; the palpi, eyes, and body, on each side also exhibiting the same sexual differences. Both male and female external sexual organs were present at the extremity of the abdomen, the "anal tuft" of the male being notably conspicuous. The pupa shell, which I have carefully preserved, is interesting, showing as it does all the peculiarities as plainly as the moth. Mr. W. F. Kirby identified this insect as *Eugonia (Ennomos) angularia*, and invited me to exhibit it at the October meeting of the Entomological Society of London, which I did. The second

hermaphrodite I have met with is a specimen of *Plusia verticillata*, which I captured in the larval state at Wakapuaka, Nelson, on January 10th, 1882, the moth unfortunately emerging with the wings much deformed on February 6th. In this instance the difference is only observable in the colour of the wings, which are lighter and with a faint pink blush on the right side as in the female. In all other respects the insect is a male. Grease has now almost completely ruined this already very poor specimen. Another insect which I believe to be hermaphrodite in its nature is a specimen of *Vanessa gonerilla*, bred in January, 1883. The larva, which was the latest in changing, and much starved owing to the nettles running short, appears to have had much difficulty in turning into pupa, as it fell down and knocked in the right wing-case and left palpus. When the butterfly emerged in a fortnight's time I noticed that the wings of the right side, although perfectly formed, were much smaller and more deeply indented than those of the left, the anterior margin of the right wings being, in addition, considerably more convex. The antenna on the right side is, also, nearly half a line shorter than its fellow, and the abdomen on the right side has shrunk up, the left side retaining its original form. These peculiarities may be said to arise from the accident which befel it when undergoing its transformation, but the fact of the abdomen collapsing on the right side cannot, I think, be attributed to this cause, indicating, as it does, an internal difference of structure, viz., the absence of a right ovarium. On examination, the external sexual organs appeared to be rudimentary.—GEO. VERNON HUDSON; Karori, Wellington, New Zealand.

RETINIA TURIONANA.—I have collected lately a lot of pupæ of this species; up to this date I have bred thirty-two ichneumons and two moths.—WILLIAM MACHIN; May 14, 1885.

NOTES ON PLATYPTILIA GONODACTYLA.—The last sentence of Mr. Gregson's letter, as to the likelihood of having another "plume" to account for in our collections, has induced me to write a few words with regard to the above species, which still puzzles some of those who ought long ago to have cleared up any mystery there may be in the economy of such a common species. As far back as 1880, in vol. xiii. of the 'Entomologist,' p. 283, Mr. Machin writes, "*P. trigonodactylus* (*gonodactyla*) was

abundant in June; the second brood equally abundant on Saturday, the 4th of September." Mr. Gregson and Mr. South do not appear to be aware of the fact that this species is double-brooded, or, if they are, their notices would lead one to suppose they are not; for Mr. South, in his description of the species (Entom. xv. 31, 32), states:—"The larva feeds in *Tussilago farfara* during April and May;" and that "the pupa may be found among the seed-down in May." He does not allude even to the probability of a second brood, although the fact had been previously recorded as above. Mr. Gregson writes, in the last issue of the 'Entomologist' (Entom. xviii. 151), "We have a coltsfoot-feeding larva in Wales, in June, which makes a gallery through the fluff on the under sides of the leaves," and at once suggests, "Can this be the larva of *P. farfara*?" As June and July are the months when the second brood of larvæ of *P. gonodactyla* are feeding, and as the second brood of this species cannot then feed on the flower-heads, because there are none, I think it would be much more reasonable to suppose that the larvæ he refers to are those of *P. gonodactyla*, rather than those of *P. farfara*. It ought to be no trouble to breed the fluff-mining larva, and put all doubt at rest, besides the satisfaction of giving us something new, should Mr. Gregson's suggestion turn out correct. I think, however, were he to breed these summer larvæ, he would most probably find that the imagines were smaller, darker, and dingier—most certainly not redder—than the early brood of *P. gonodactyla*. The colour of the second brood of this species seems to be a more uniform grey, nothing like so sharply marked as in the first brood. This is especially the case when the insects come out early, and get through their metamorphoses rapidly, when the more dingy appearance of the second brood is not improved by being apparently bleached, which is sometimes the case with the most perfect specimens. Mr. South's remark as to the appearance of his bred series (Entom. xv. 32), when compared with later-caught specimens, appears to bear out the above suggestions, and to show that when the insects, through artificial circumstances, are hurried through their changes, even in the early brood, they will produce a bleached form. Mr. South's description of the larva, from which he bred his bleached-looking specimens, struck me as being a good description of the larva of the early brood obtainable here. As I am away

from home the greater part of the time when the second brood is in the larval state, and as this brood can always be obtained abundantly in the autumn, I have never reared it. My experience of the imagines of *P. gonodactyla* may be summarised as follows:—

1. There are two broods; one occurring in June, the other in the latter part of August, September, and October. 2. The second brood is generally smaller, and not so decidedly marked, the earlier specimens of this brood especially having a bleached appearance. 3. The imagines vary widely in size, colour, and intensity of markings, from the same locality. I have taken some hundreds of the species, and bred many; and there is no doubt that the extreme forms might, by those ignorant of the species, be taken as allied species. But if we are to take every shade of colour and difference of size as determining a species, we shall soon get our plumes into the same condition as we seem to have got the genera *Agrotis* and *Scoparia*.—J. W. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E., May 10, 1884.

THE GENUS *PLATYPTILIA*.—In the note appended to my description of *P. gonodactyla* (*trigonodactylus*), (Entom. xv. 32), I solicited further assistance to enable me to elucidate some difficulties which presented themselves in the satisfactory identification of certain forms of this species (?) seen by me in collections. To this end I asked for larvæ of the coltsfoot-feeding “plume” from any locality, but none were sent me. Although I have not myself met with specimens later than the first week in July, I have been informed by Mr. Machin and other entomologists that there are two broods of *gonodactyla* in the year. Granted that there are two broods, and that the individuals of the second brood are generally smaller and less decidedly marked than those of the first brood, we still lack an important item of knowledge. What is the larva of the second brood like? Is it identical with the larva which feeds and pupates in the seed-heads of the coltsfoot? Recent experience with certain species of Lepidoptera has induced me to conclude that colour and ornamentation are not in all cases thoroughly trustworthy characteristics whereby we can differentiate species. The genus *Platyptilia* is a most perplexing one; and until we know the larvæ of not only all the species, but in the case of a horeomorphic species, such as *gonodactyla* would appear to be, of each form of the species, we shall be unable satisfactorily to determine the

species of this genus. I have lately had a favourable opportunity of comparing some of our British Pterophoridae with continental types other than those I already possessed; and among other things I was convinced that the *zetterstedti* of our lists is not the *zetterstedti* of Zell. In fact I question if Zeller's species has ever occurred in this country. On the other hand, I believe that the insect described by me (Entom. xv. 33) as *zetterstedti*, Zell., has not as yet been observed on the Continent. Again, I should not be greatly surprised if my *tæniodactylus* proved to be a form of our pseudo-*zetterstedti*. At present the two insects appear sufficiently distinct, but "breeding" may show that they are only forms produced from identical larvæ. The larva of *Platyptilia farfarella*, Zell., burrows, I believe, in the tomentose under sides of the leaves of *Tussilago farfara*; and I am inclined to think that probably the plume-moth, bred from a larva found feeding "in, or under, the woolly under sides of a coltsfoot leaf," by Mr. Gregson, in Wales, and recorded in the 'Entomologist' (Entom. vi. 427), and again referred to (Entom. xviii. 151), was the *farfarella* of Zeller; but whether *farfarella* is specifically distinct from *gonodactyla*, Schiff., or is only a seasonal form of that species, I am not prepared to say. In an early number I will give a description of the imago of *Platyptilia farfarella*, Zell. —RICHARD SOUTH; 12, Abbey Gardens, London, N.W., May, 1885.

EPISCHNIA FARRELLA, CRAMBUS ALPINELLUS, &C., IN NORFOLK. —Last year I took on our coast a fine series of *Epischnia farrella*. The species was local, and apparently like many insects taken in such situations it soon becomes worn; and an effort to procure eggs from living females proved a failure. During the afternoon of August 11th I disturbed from the grass on the sand-hills a *Crambus* quite new to me; and a second specimen was taken by my brother on the same occasion. These, whilst on the setting-boards, were recognised by Mr. W. Warren as *Crambus alpinellus*. I may note here that in the same place *C. fascelinellus* was by no means rare; but the abnormal heat (the thermometer registering 93° F. in the shade) made entomological work on the sand-hills well nigh intolerable. On the 6th of August I found *Agdistes bennettii* so common in an adjoining salt-marsh, shortly before dusk, that I boxed upwards of forty specimens, in, I believe, little more than ten minutes.—EDWARD A. ATMORE; King's Lynn, Norfolk, May 6, 1885.

NOTES ON GALL COLLECTING.—For the last seven or eight years I have devoted my spare time from December to April in collecting galls of various species, making from sixteen to twenty journeys each year. A long rod is indispensable, and some patience is required to fill my eight large cages. With me gall collecting has not proved a success; but it has this advantage,—it can be pursued during the winter, when there is little or nothing else to be done in Entomology, and the specimens of moths reared from them are always in the finest possible condition. My principal object has been to complete my series of *Ephippiphora obscurana*; of this I have only netted two specimens in the perfect state during my thirty years' collecting. I have bred from galls the following Lepidoptera (besides a host of species of other orders, which I do not collect):—*E. obscurana*, scarce; *Coccyx splendidulana* and *C. argyrana*, common; *Heusimene fimbriana*, not common, and principally from the Kentish woods; *Teleia luculella*, common, and *Gelechia scalella* (*aleella*), scarce; *Bucculatrix ulmella*, a fair series; *Æcophora lunarella*, nine the first year, but none since; and two or three of the genus *Nepticula*.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., May 14, 1885.

APHIDES AND THEIR PARTIALITY FOR STRONGLY-SCENTED PLANTS.—The predilection of Aphides for the leaves of highly-scented conservatory plants, and plants bearing fragrant flowers, is certainly remarkable. For instance, the strongly-perfumed pelargoniums are peculiarly liable to become infested; the other geraniums—with the exception of the ivy-leaved, the leaves and scent of which bear so extraordinary a resemblance to the plant after which it is named—are never, or “hardly ever,” thus blighted; and it may be noted that the stronger the odour the more liable to Aphis attack,—the nutmeg, the oak-leaf, the lemon, and the old-fashioned “unique,” with its scent of peppermint, being especial penchants of the green-fly. Look, too, at the rose (“sweetest flower that grows”), at the lemon verbena, the *Daphne odorata*, and the carnations, how thickly covered they all become with the detestable little pests. With plants out of doors the rule seems to be reversed, for whilst gooseberry and currant trees, white and red, are frequently sadly disfigured by thick swarms of Aphides, the aromatic black currant and the poisonous (?) American *Ribes* escape unmolested. The only

reason for the preference given to the scented plants of the green- and hot-house, that I can suggest, is that they are, as a rule, more succulent and juicy than others; and it may be the aroma imparts a flavour which, to the "goût" of *Aphis* epicures, is somewhat analogous to the "bouquet" of choice wines.—JOSEPH ANDERSON, jun.; Chichester, April, 1885.

NORTH KENT ENTOMOLOGICAL SOCIETY.—The first bi-annual meeting of this Society was held on Thursday, May 7th, at the "Duke of Connaught" Coffee Tavern, New Road, Woolwich. Mr. J. B. Smith, vice-president of the Society, occupied the chair. After some remarks from the chairman, the officers for the ensuing six months were elected; and the Secretary read a report of the progress of the Society, which was formed in November, 1884, and now numbers seventeen members, a large majority being working men. During the past six months there have been some very interesting exhibits made by various members, and discussions of all subjects concerning Entomology, from which the younger members have derived much benefit. The Society has evidently supplied a want long felt by entomologists in the locality.—H. J. WEBB, Hon. Sec.; 5, Down's Place, Plumstead, May, 1885.

REVIEW.

Russian Central Asia; including Kuldja, Bokhara, Khiva, and Merv. By HENRY LANSDELL, D.D. With maps and illustrations. 2 vols., 8vo. London: Sampson Low & Marston, 1885.

THIS work has been handsomely produced, and appears to be the result of careful observation conducted in the countries visited and described. The notes on the Natural History of that part of Central Asia are of interest, as little was previously known upon the subject by western naturalists. This information is contained in very copious appendices. It does not consist of original work by the author; but he has done perhaps better service by having reproduced in English that which had been already recorded by Russian naturalists in the Russian and German tongues, and the whole will form a valuable basis for

future investigations. The different sections have been edited by experts, so that we may look upon the lists as authentic copies from the original works of the Russian students.

The body of the work treats upon a large number of subjects, as will be gathered from the general index, which contains some 5000 entries. These are most diverse, and include Meteorology, Education, Crime, Disease, Botany, Silk-culture, Bee-keeping, &c.

We can fully recommend this work as one which will add much to our knowledge of a little-known portion of the world that ought to be studied by all Englishmen interested in the foreign relations with British possessions.

OBITUARY.

NICHOLAS COOKE.—We much regret to have to record the sudden death of Nicholas Cooke, of Gorsey Hey, Liscard, Cheshire. Mr. Cooke was born at Liverpool, 14th of January, 1818, and died on May 19th, 1885, at the residence of Mr. Briggs at Leatherhead, where he had gone to spend the evening, in company with Messrs. Howard Vaughan and Carrington. Mr. Cooke was a member of a well-known family, members of the Society of Friends, his father having founded one of the oldest firms of cotton-brokers in Liverpool. The subject of this notice had for many years been connected with a house of wool-brokers. The taste for Entomology appeared to have been born in the family, for when quite children he and his brother, the late Benjamin Cooke, long before they had heard of Entomology as a science, caught butterflies, moths, and other insects, and pasted them in large numbers on the walls of their nursery. This taste was fostered and organized on their becoming students at the Friends' School at York, where at the same time were other scholars with a like taste, who afterwards became eminent entomologists, among them being Edwin Birchall and Thomas Allis. Nicholas Cooke seldom published anything on Entomology except in the briefest terms. This is greatly to be regretted, as with him dies an immense fund of information. As a collector he was most successful, and his name must always be associated

with the discovery of *Nyssia zonaria* and other species in Britain, as well as the capture of *Sesia scholiiformis* and *Crymodes exulis*, both of which species were taken by him in greater numbers than by anyone else in this country. His collection had become one of the largest in England. He had incorporated with it the whole of the late Mr. Greening's (of Warrington) and the major portion of the late Edwin Birchall's. His series were generally the full length of the drawer, giving opportunity for the study of local and other variation, the *Sesiidæ* and the genus *Eupithecia* being probably unequalled. The field of his work included not only the districts around his home, but extended to North Wales, Lancashire, the Lake district, and the Highlands of Scotland, which latter he had annually visited for many years past, making Loch Laggan his headquarters. In conjunction with Mr. Samuel Capper and other friends he was instrumental in founding the Lancashire and Cheshire Entomological Society, which now numbers some fifty members. In this Society he took great interest, and was one of the vice-presidents. It is highly satisfactory to learn that his collections will remain intact, it being found by a codicil added to his will within a month of his death that he has bequeathed the whole to the Mayor and Corporation of the City of Liverpool, and they will doubtless be deposited in the Brown Museum in that city. These collections consist of British Lepidoptera, an almost complete one of European butterflies, and one equally perfect of British birds' eggs. For some time before his death Mr. Cooke was engaged rearranging the Lepidoptera according to the 'Entomologist' List. He was interred at the Wallasey Cemetery, his funeral being largely attended, many of the entomologists of the Liverpool District being present. Mr. Cooke leaves a widow and family, the latter being grown up, his eldest son, Mr. Isaac Cooke, being a successful and rising artist. His death was caused by heart-disease, contracted by over-exertion in April last, when he was overtaken by storm while fishing on Loch Laggan. The labour of a five miles' row against a strong wind had produced injuries which have proved fatal.—J. T. C.

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THE LEPIDOPTERA OF BURTON-ON-TRENT AND NEIGHBOURHOOD.

AMONG the various Natural-History Societies which exist throughout the country only a few are strong in entomologists. This, however, is the case with the Burton-on-Trent Natural-History and Archæological Society; and during the past winter the members of its entomological section have occupied themselves in compiling a new list of the Lepidoptera of that neighbourhood, which, if it does nothing else, will prove that the midland counties are not quite such a barren hunting-ground as some would have us believe. The members have had the advantage of using two old lists,—one by that renowned entomologist, Mr. Edwin Brown, and contained in Sir O. Mosley's 'History of Tutbury'; the other by Mr. W. Garneys, and embodied in his work, 'The Fauna and Flora of Repton.' To these are added the observations of about a dozen living collectors, each contribution being distinguished by the initials of its finder's name. The district covered is rather a wide one, extending from fifteen to twenty miles round Burton in every direction, and has not been worked, so far as we are aware, by any other Society. It includes two famous localities,—Cannock Chase, the original British habitat of *Lasiocampa ilicifolia*; and Chartley Park, the southernmost limit of *Cænonympha typhon*; the river Trent passing through the centre. The 'Entomologist' List has been followed throughout.

The observers, whose initials appear in our local list, are as follows:—E. Brown, W. Garneys, J. T. Harris, G. Baker,

P. B. Mason, C. F. Thornewill, G. A. Smallwood, T. Gibbs, J. E. Nowers, G. H. Whitlock, and W. M. Anderson. Mr. R. Freer, of Caius College, Cambridge, has also furnished some valuable notes on the Cannock Chase district; and one or two contributions have been received from Mr. Blatch, of Birmingham.

Not much has been done at sugar, and a large proportion of the species have been bred from larvæ. Mr. Smallwood is the only member who has practised pupa-digging to any appreciable extent.

The following remarks upon the geological features of the locality have been prepared by Mr. Frank E. Lott, A.R.S.M.

The district included in this paper, having an area of 1000 square miles, it is impossible to give an extended geological notice. We may, however, mention some of the broad features of the district; and this, with a list of the principal localities, geologically classified, may perhaps be of some service, as indicating the influence of Geology on comparative Entomology.

In the first place there is a *valley area* of over 300 square miles, watered by the Trent and its tributaries—the Derwent, Dove, Tame, and Soar.

Secondly, with Burton as a centre, there are the following *elevated areas*:—Needwood Forest, on the north-west, about thirty square miles of well-wooded land, from 300 feet to 500 feet above sea-level. Cannock Chase, a heather-covered upland, about twenty square miles, from 350 feet to 600 feet, lies still more to the west. Charnwood Forest, in the east, is a rocky district, of some twenty square miles, irregular in outline and elevation, rising in parts, such as Bardon Hill and Breedon, to as much as 800 feet. The Weaver Hills, 800 feet, and Thorp Cloud, in the north, are really portions of the great limestone plateau of Derbyshire.

The prevailing geological formation is New Red, both Bunter and Keuper being represented, the former chiefly as Middle Bunter,—the mottled sandstone occurring but sparingly,—the latter largely, as Upper Keuper marls and Lower Keuper sandstone.

The great anticlinal of the Pennine Range extends across the Trent Valley, causing the inliers of limestone (partially dolomitized) at Ticknall and Breedon, and ending with the mass of Archæan rocks, forming Charnwood Forest.

There are five coal fields, more or less, included,—the whole of the Leicestershire and portions of the Warwickshire, North and South Staffordshire and Derbyshire. The soil of much of this district is formed from the boulder-clay and drift-gravels, but little modified by the underlying formations.

FORMATIONS, ROCKS, ETC.

LOCALITIES IN LIST.

| | |
|--|--|
| Archæan. | Charnwood Forest. |
| Intrusive greenstone. | Bardon Hill. |
| Mountain limestone. | Dovedale, Ticknall. |
| Mountain limestone and Upper Keuper marls. | Breedon Cloud Wood, Calke Abbey. |
| Yoredale Shales, and Bunter con- glomerate and alluvium. | Ashbourne and Okeover. |
| Yoredale Shales, Gritstone, with alluvium. | Little Eaton. |
| Gritstone. | Breadsall Moor and Belper. |
| Gritstone and Bunter conglomerate. | Repton Rocks and Shrubs, and Bretby Park. |
| Coal measures. | Ashby, Newhall, Cheadle, Cannock, Ilkeston. |
| Bunter conglomerate. | Cannock Chase, Repton, Milton, Seal Wood. |
| Lower Keuper sandstone. | Winshall, Brizlincote. |
| Lower Keuper sandstone, Bunter conglomerate, with alluvium. | Rugeley. |
| Keuper marl and alluvium. | Burton, Branstone, Barrow, Willing- ton, Rollestone, Eggington, Derby, Long Eaton, Loughboro', Drakelow, Cauldwell, Horninglow, Stafford, Rugeley. |
| Keuper marl. | Somershall, Cubley, Marchington, Chartley Park, Etwall, Findern, Grange Wood, Tatenhill, Ather- stone. |
| Keuper marl and boulder-clay. | Sinai Park, The Oaks, Knightley Park, Hoar Cross. |
| Rhætic beds and boulder-clay. | Needwood Forest, Swilcar Wood, and Bagots Park. |

RHOPALOCERA.

Aporia crataegi, a nest of larvæ found by Rev. F. M. Spilsbury, in his garden, at Barrow-upon-Trent, feeding on apple.

Pieris brassicæ, *P. rapæ*, *P. napi*, common throughout the district.

Euchloë cardamines, common throughout the district.

Colias edusa, clover fields at Repton (W. G.), Horninglow, Newton

Solney, and Brizlincote (J. T. H.), Winshill (G. B.), Branstone (J. E. N.), Ashby (G. A. S.). Variety *helice*, clover fields at Repton (W. G.).

Gonopteryx rhamni, Seal Wood and Dovedale (J. T. H.), Repton Shrubs (G. B.), Egginton (W. M. A.).

Argynnis selene, Bagot's Park (C. F. T.), Dovedale and Chartley (J. T. H.), Charnwood Forest (J. E. N.). *A. euphrosyne*, formerly in Repton Shrubs and Seal Wood (E. B. and J. T. H.). *A. aglaia*, abundant on Cannock Chase (J. E. N. and C. F. T.). *A. paphia*, Repton Shrubs and Seal Wood (E. B.), formerly in Repton Shrubs (J. T. H.), formerly at Anker Church (W. G.).

Melitæa aurinia (artemis), Charnwood Forest (E. B.), one at Burton (G. H. W.).

Vanessa c-album, Repton Shrubs and Seal Wood (E. B.), Repton (W. G.), Bardon Hill (J. T. H.), Calke Abbey (H. A. Stowell). *V. polychloros*, scarce (E. B.), Needwood Forest and Dovedale (J. T. H.), one at Burton (W. J. Pickering), one at Barrow (G. A. S.). *V. urticae*, common throughout the district. *V. io*, occurs occasionally throughout the district. *V. antiopa*, once at Milton (W. G.). *V. atalanta*, occurs throughout the district, some years abundantly. *V. cardui*, abundant throughout the district some years.

Pararge ægeria, Seal Wood (E. B.), Repton Shrubs (W. G.), Bardon Hill (J. T. H.). *P. megæra*, common (E. B.), scarce since 1861 (W. G.), forest banks, Needwood (J. T. H.), Charnwood Forest (J. T. H.).

Satyrus semele, Bunster Hill, Dovedale (J. T. H.).

Epinephele ianira, common throughout the district. *E. tithonus*, common (E. B. and W. A.), Sinai Park (G. B.), Charnwood (J. T. H.). *E. hyperanthes*, common in woods (E. B.), Repton Shrubs (W. G. and G. B.), Seal Wood (W. G. and J. T. H.), Needwood Forest (T. G.).

Cænonympha typhon (davus), Chartley Moss (J. T. H.). *C. pamphilus*, Chartley Park and Charnwood Forest, abundant (J. T. H.), Bagot's Park, abundant (C. F. T.), Cannock Chase, abundant (J. T. H.).

Thecla betulae, taken on Cannock Chase (R. F.). *T. w-album*, Burton-on-Trent and Brizlingcote, but rare (E. B.), Repton Shrubs, abundant (G. B.), Seal Wood (J. E. N.). *T. quercus*, Repton Shrubs (E. B.), Seal Wood (G. B.), Charnwood Forest (J. T. H.). *T. rubi*, Dovedale, plentiful formerly (J. T. H.), Cannock Chase, abundant (J. E. N. and R. F.).

Polyommatus phlæas, common (E. B. and W. G.), Tatenhill (W. M. A.), Chartley Park (J. T. H.), Cannock Chase (C. F. T.), Bretby Park, Repton Rocks, and near Repton Shrubs (T. G.).

Lycæna astrarche (agestis), Dovedale (E. B.). *L. icarus (alexis)*, generally distributed throughout the district. *L. argiolus*, scarce round Repton (W. G.), abundant in Needwood Forest. *L. minima (alsus)*, common in Dovedale (J. T. H.).

Nisoniades tages, Dovedale (E. B. and J. T. H.).

Hesperia thaumas (linea), not uncommon (E. B.). *H. sylvanus*, not uncommon (E. B.), Bagot's Park, common (C. F. T.), Chartley (J. T. H.). *H. comma*, Chartley (J. T. H.).

HETEROCERA.—SPHINGES.

Acherontia atropos, larvæ on potato and tea tree (E. B.), occasionally in some abundance (W. G.), Willington (F. M. S.), occurs occasionally throughout the district.

Sphinx convolvuli, occurs occasionally (E. B.), Repton, some years ago in some abundance (W. G.), Barrow (G. A. S.), several specimens recently taken in Burton. *S. ligustri*, not unfrequent (E. B. and W. A.), Findern (G. A. S.), one larva at Stapenhill (C. F. T.).

Chærocampa celerio, one taken in Bass & Co.'s yard, November, 1880 (G. B.). *C. porcellus*, single specimens taken in Rugeley several years (R. F.). *C. elpenor*, frequent, in larval state (E. B.), scarce, larvæ in wet places (W. G.), larva on apple at Barton (C. F. T.), one pupa (G. B.), one larva at Shobnall (J. T. H.).

Smerinthus ocellatus, common in orchards (E. B. and W. G.), occasionally on apple (J. E. N.), on *Populus alba* in Bretby Lane (J. T. H.). *S. populi*, common throughout the district. *S. tiliæ*, Cubley (E. B.).

Macroglossa stellatarum, occurs in abundance some years.

Trochilium apiformis, larvæ on poplars, Findern cover (W. A.). *T. crabroniformis (bembeciformis)*, in osier beds occasionally (E. B.), osier beds at Repton (W. G.), Burton (J. E. N.), Newton (J. T. H.), Little Eaton (G. B.).

Sesia sphegiformis, several specimens were taken a few years ago in Repton Shrubs among young alders (E. B.), Repton Shrubs (J. T. H.). *S. tipuliformis*, common throughout the district. *S. asiliformis (cynipiformis)*, some specimens, chiefly females, taken on stumps of trees in Repton Shrubs (W. G.). *S. culiciformis*, Repton and Seal Woods (E. B.), one specimen in Seal Wood (J. T. H.).

Ino statice, frequent in meadows (E. B.), in mowing grass, near Milton (W. G.), in meadow, near Stanton (J. T. H.), Ashborne and Dovedale (J. T. H.).

Zygana loniceræ, Repton Shrubs (E. B.), in mowing grass on Burnet, &c. (W. G.). *Z. filipendulæ*, common (E. B.), in mowing grass on Burnet, &c. (W. G.), Dovedale, common (J. T. H.).

BOMBYCES.

Hylophila prasinana, common throughout the district.

Nola cucullatella, common throughout the district. *N. confusalis*, Burton (E. B.), at rest on trees in Repton Shrubs (W. G.).

Nudaria mundana, scarce (E. B. and W. G.).

Lithosia lurideola (*complanula*), common (E. B.)—(W. G.), larva at Willington (C. F. T.).

Deiopeia pulchella, said to have once occurred at Repton ('Entomologist,' xvii. 141).

Euchelia jacobææ, occurred some years ago in a garden at Burton (E. B.), plentiful on Charnwood Forest (E. B. and J. T. H.).

Nemeophila russula, Chartley Moss (J. T. H.), Cannock Chase, common (F. R.). *N. plantaginis*, Dovedale (E. B. and G. B.), Bardon Hill (J. T. H.)

Arctia caia, common throughout the district.

Spilosoma fuliginosa, Newton Solney and Dovedale (E. B.), once at Willington (W. G.), Chartley and Bardon Hill (J. T. H.), Cannock Chase (R. F.), once at Little Eaton (G. S.). *S. lubricipeda* and *S. menthastri*, common throughout the district. *S. mendica*, near Marchington (E. B.). *S. urticæ*, larvæ found once near Burton (E. B.).

Hepialus humuli, common throughout the district. *H. sylvanus*, common (E. B.), Tatenhill (J. T. H.), once in Bretby Park (T. G.). *H. velleda*, Seal Wood (E. B.), one in Repton Shrubs (W. G.), common at Bretby (T. G.). Variety *gallicus*, common at Bretby (T. G.). *H. lupulinus* and *H. hectus*, common throughout the district.

Cossus ligniperda, generally distributed throughout the district.

Zeuzera pyrina (*æsculi*), Yoxall (E. B.), Newton Solney, *in cop.* (J. T. H.), larva in pear, at Rolleston (G. B.), larva in quince, at Burton (C. F. T.), once at Burton (S. R. Hallam).

Porthesia similis (*auriflua*), common throughout the district.

Leucoma salicis, Burton (E. B.), Burton, abundant (G. B.), on poplars, at Findern (W. G.).

Dasychira pudibunda, Henhurst, but rare (E. B.), scarce (W. G.), Findern (G. A. S.).

Orygia gonostigma, one larva taken at Rugeley (R. F.). *O. antiqua*, common throughout the district.

Trichiura cratægi, rare (E. B.), larvæ on highest shoots of hawthorn (W. G.), Tutbury Road (G. B.), Willington (J. E. N.), one near Ashby-de-la-Zouch (G. A. S.).

Pæcilocampa populi, occurs occasionally (E. B.), Needwood Forest (J. T. H.), near Repton (P. B. M.), Repton village (C. F. T.), Ashby (G. A. S.).

Eriogaster lanestris, common (E. B.)—(W. G.), Needwood Forest and Willington (J. E. N.).

Bombyx rubi, Dovedale (E. B.), plentiful in Dovedale (J. T. H.), Cannock Chase (G. W. Blatch). *B. quercus*, not common (E. B.), occurs occasionally throughout the district.

Odonestis potatoria, common throughout the district.

Lasiocampa quercifolia, a few larvæ taken near Rugeley (R. F.).
L. ilicifolia, Cannock Chase (E. B. and R. F.).

Saturnia pavonia (carpini), one larva at Tatenhill (E. B.), common on Cannock Chase (J. T. H. and R. F.).

Drepana lacertinaria, near Ashby (G. A. S.). *D. falcataria*, Seal Wood (E. B. and G. H. W.), Chartley (J. T. H.).

Cilix glaucata (spinula), common throughout the district.

Dicranura bicuspis, on alder, but rare, Eggington, &c. (E. B.), Rolleston Park (C. F. T.). *D. furcula*, on willows, but not common (E. B.), Repton (P. B. M.), Repton Shrubs (G. B.), Barrow-on-Trent (G. A. S.), Charnwood Forest (E. H. Todd). *D. bifida*, fairly common throughout the district. *D. vinula*, common throughout the district.

Pterostoma palpina, Seal Wood and Repton Shrubs (E. B.), Burton (G. B.), Barrow (G. A. S.).

Lophopteryx camelina, common throughout the district.

Notodonta dictæa, Seal Wood and Burton (E. B.), near Repton (W. A.), Stapenhill (J. T. H. and G. B.), Derby (G. A. S.), near Ashbourne (H. F. G.). *N. dictæoides*, once at light, at Derby (G. B.). *N. dromedarius*, Repton Shrubs and Derby (G. B.), near Ashby (G. A. S.). *N. ziczac*, Seal Wood (E. B.), near Repton (W. G.), Repton Shrubs (G. B.), Derby (H. F. G.), one near Barrow (G. A. S.). *N. chaonia*, Repton Shrubs (G. B.). *N. trimacula (dodonea)*, Seal Wood (E. B.), Repton Shrubs (G. B.).

Phalera bucephala, common throughout the district.

Pygæa curtula, Burton (E. B.).

Thyatira derasa and *T. batis*, fairly common throughout the district.

Cynatophora duplicaris, Henhurst (E. B.).

Asphalia diluta, Henhurst (E. B.), near Ingleby (W. G.). *A. flavicornis*, Repton Shrubs (J. T. H. and G. B.), one at Burton (W. J. Pickering), Barrow (G. A. S.), common in Birch Valley, Cannock Chase (R. F.).

(To be continued.)

ADDITIONAL NOTES UPON SETTING LEPIDOPTERA UNPINNED.

BY GEORGE COVERDALE.

A YEAR has now elapsed since the attention of entomologists was called, in the pages of this magazine, to the advantages of setting insects unpinned (Entom. xvii. 131). During that period no efforts have been spared to effect improvements in this system and render it more practical and easy of accomplishment,

and it is indeed a source of satisfaction to find that the thought and labour bestowed upon the subject has resulted in some radical changes for the better. I therefore again venture to press upon entomologists, especially Micro-Lepidopterists, the advisability of giving a fair and impartial consideration to the merits of this system and the advantages to which it lays claim. The whole process consists essentially of two distinct stages; the insects have first to be *set*, and afterwards *mounted*, upon a support, and the way in which this is accomplished I shall now proceed to describe.

Setting.

Suppose we have a *Nepticula* to deal with. After it is killed, throw it on to the setting-board. With the setting needles then turn it on to its ventral surface and hold the insect down (say with the left hand) with one needle by gently pressing the body where the abdomen joins the thorax, that is to say, at the base of the anterior wing on the inner margin. A breath will now blow out at least one pair of wings, probably the right hand pair, perhaps both; but this depends upon the position in which the setting needle is held. If only one pair is blown out, change the setting needle to the right hand and repeat the operation, when all the wings will be expanded. At this stage the position of the legs and antennæ may advantageously receive attention, the first and third pairs of legs being the most important. The next thing is to place the insect, wings expanded, upon the groove of the setting-board, but before proceeding further it should be noted that the size of the groove, both as regards width and depth, is a most important matter. It should certainly not be wider than the thorax of the insect, even a tight fit being sometimes an advantage, and its depth just sufficient to allow the body to touch the bottom of the groove with the wings resting flat upon the board. With a steady hand now raise the insect up by sliding the two setting needles one under each pair of wings and lifting it into the groove of the board. If the size of the groove has been properly chosen a slight pressure with the needle will suffice to retain the insect in its proper position for setting, or perhaps a pin or a brace may be required for that purpose. The wings are now to be got into position for bracing, which is best accomplished by pushing them up not *horizontally*, but by working in a *curve vertically*. A little reflection will show

that one might expect such a result, because this is the natural line followed by the up and down motion of the wings in flight, and they move much more freely in this direction than in any other. Indeed I have on many occasions set out a *Nepticula* on the board without placing it into the groove at all, or employing any means whatever to keep the body still, such a delicate operation being utterly impossible without a due regard to this important matter, and I must urge upon all who wish to succeed the imperative necessity of careful thought and attention to these details of manipulation. Large insects will require some little modification in the process, such as a couple of pins placed against the shoulders, and sometimes cross ones to keep the abdomen down, but the principle is the same for all. An hour's practice will teach these points far better than I can describe them. Our *Nepticula* being now properly set, the next thing to consider is the mounting.

Mounting.

This, of course, is not commenced until the *Nepticula* is dry. Take a pin (say a No. 20), cut off the head, and with the forceps turn down at right angles a short piece of the pin, a little shorter than the body of the insect. The *Nepticula* should now be unbraced and placed on its back on the edge of the setting-board, so that its antennæ may project over and not get broken. Stick the bent pin into a little block of cork, which will serve for a handle, and then dip the bent portion into a solution of shellac in spirit, and apply the pin to the ventral surface of the thorax and abdomen, so that the small bent portion points to the head of the insect. If the shellac is sufficiently liquid the pin will instantly adhere, and with the forceps may be stuck into the setting-board to dry. As this drying process goes on a little attention will be required to keep the insect in a horizontal position. This is easily accomplished by occasional touches with the setting needle. If the shellac is too liquid it will penetrate the body, and perhaps spread to the wings of the insect, which will then have the appearance of having become greasy; if not sufficiently liquid, the adhesion of the insect to the pin will be imperfect and insecure. A few trials will soon disclose the happy medium. If the shellac is in a watch glass or any very open vessel a drop or two of spirit must be occasionally added

to make up the loss by evaporation. It is a good plan to use the shellac from a small test-tube. With larger insects, such as Tortrices, the head of the pin is first beaten out flat, and then turned down, this giving a larger surface to support the body; with larger insects still, such as Pyrales, the head of the pin, after being beaten out, is split up with a pair of scissors so as to form a fork, and then turned down as usual; with even larger things, such as Sphingidæ, the two ends of the forked part may be turned upwards with the forceps, so as to form a cradle which admirably supports the bodies of the largest species. Indeed there is here a wide field open for originality and ingenuity, almost every group of insects demanding some modification in their treatment to suit their own special structure. Of course, different size pins are used to accommodate the various species, but I think it would be well to adopt one uniform height at which they should be supported from the surface of the cork. This is, evidently, an easy matter, depending upon the length which is turned down and the thickness of the thorax.

On referring to the plan which I last year recommended, it will be seen that the process has been much simplified. In the setting, there is now no occasion for the supports formed of pins stuck into a piece of cork, and consequently no coaguline is required. In the mounting, the pith blocks are done away with in favour of the bent pin, which is more sightly, is stronger, being all of one piece, and permits a free view of the insect from beneath. I have also given up gum tragacanth in favour of shellac in spirit. The advantages of this new method have previously been enumerated, so there is no occasion to repeat them, but I will devote a few words to the consideration of the points which have been raised against it. In the first place it is said to be difficult to remove an insect from the middle of a series. This, I will admit, is not an easy matter with the ordinary thick forceps, but after a little practice I find no difficulty when slender curved forceps are employed, and when the insects are very close together they may generally be approached from the side. Secondly, it is said by one of my thoughtful German correspondents that the legs might be so obscured by the shellac as to render a study of their anatomical details a matter of difficulty, but this is not at all the case if the legs have had due attention paid them in the setting, and been

properly extended; the middle pair would no doubt suffer in this respect, but such a trifling drawback weighs nothing against the important advantages secured by this method. Just lately I was told that the shadows cast at night time by the pins on the paper beneath were embarrassing, but this applies to all insects set high up on the pin, and surely a greater objection belongs to our present system, where these shadows are cast, not beneath, but across the insects themselves. I am quite unable to claim any economy of time for the new process, for, although the setting is facilitated, there is the mounting to do afterwards, the complete process occupying about the same time. The smaller the insects the greater the advantages of this system over the old method. In conclusion, I may say that to any one sending me a postal box I shall be most happy to return a few specimens set unpinned, and give any further information in my power. As an inducement to entomologists to give it a trial, I can say that I have never failed to set even the smallest Micro in this way. No one, I think, would guarantee to do this by pinning *Nepticulæ*, and I am on the look-out for something more diminutive than a *Nepticula* to experiment upon. I should be thankful to any entomologist who would send me a few Diptera or any other atom, and would do my best to return them properly set.

24, Fleming Road, Lorrimore Square, S.E., June 3, 1885.

[Mr. Coverdale has been good enough to send, for my inspection, two series of Lepidoptera set without pinning, after the manner advocated by him. These consist of *Pyrales* and *Nepticulæ*, which are certainly very beautifully set and in exceptionally fine condition. This mode of setting insects (which is so original that it ought to bear the name of its inventor, and be known as "Coverdale setting") has the great advantage that there need be no loss of scales or other damage upon the side exposed to view, by the insertion of a pin through the thorax, as in ordinary setting. Entomologists are naturally conservative in their habits when considered in connection with their study of insects, whatever may be their politics. Many will resent this as an innovation because it will upset the symmetry of their collections even more than the adoption of a new list of names, or arrangement. All things are, however, regulated by market demand, and when Mr.

Coverdale's system becomes fashionable it will doubtless be so because its advocates will have had the moral courage to set their insects in the new style for the sake of the advantages it offers over our present style of setting insects by pinning them through the thorax. Some of our friends prefer to see their specimens with apices of wings touching the paper of the cabinet drawers, while others set sufficiently high to brush beneath the wings, and so keep the paper clear of dust, or the more readily to see the traces of cabinet enemies. By the Coverdale system we can have the moths close to the glass covering the drawers, and thus in a better position for observation. Another advantage is that no evil effects can occur from oxidization of the pins and the irritating "springing" of the wings in consequence. Some collectors may object to it because it will be necessary for them to take a little more pains in setting, but their correspondents might not share the same objection when receiving insects from them. Others will not like it because it will be impossible to take up an insect with the fingers, and will even require a modification of the forceps at present used for that purpose. Whatever may be the future for the Coverdale setting, it is a very remarkable innovation, and one well worth study. The examples sent are beautiful enough to tempt one to seriously think of making a new collection set after Mr. Coverdale's new fashion.—JOHN T. CARRINGTON.]

NOTES ON THE *AGROTIDÆ*.

By J. W. TUTT.

IF your correspondent, Mr. Gardner, had given my note respecting the *Agrotis* the most cursory attention, he would not have credited me with coming to the conclusion that *Agrotis tritici* and *A. nigricans* were one and the same species. I have come to the very decided opinion, as I expressed in my previous note, that *A. obelisca* and *A. aquilina* are only divergent forms of *A. tritici*; and until they are bred from eggs I shall most likely hold the same opinion. All my remarks concerning *A. nigricans* were to show that my experience led me to believe that it was specifically distinct. I have bred a number of *nigricans*, and never seen a *tritici* among them; and in localities where

A. nigricans swarm it is, I know, impossible to find a specimen of *A. tritici*. Besides this, *A. nigricans*, except in ground colour, is so constant in markings that it required no confirmation to convince me of their actual distinctness. In cases where *A. nigricans* is mentioned as a probable form of *A. tritici*, I have doubts whether the forms obtained and called *nigricans* are really the same species we know by that name. I had no idea that anyone wished to prove that *A. segetum* and *A. tritici* are the same species; and the life-history of *A. segetum* is, I believe, fairly well known. With the latter part of Mr. Gardner's note I can quite agree; and I think he points out the exact spot where the weakness of many old records exist, *viz.*, in assuming that a large number of larvæ obtained in a place at the same time must of necessity be one species, and all insects bred from such larvæ must be forms of the same species.

I was also very pleased to see Mr. Gregson's letter taking up the other side of the question, *viz.*, the reason for considering *A. tritici*, *A. aquilina*, and *A. obelisca* specifically distinct. His letter is instructive, so far as it goes, but it proves nothing. In the first place Mr. Gregson makes a point of the different size of the larvæ. I have some specimens of undoubted *tritici* much larger than any *aquilina* or *obelisca* I have ever seen. Everyone knows that species vary in size. Is it probable that the larva which will produce a small specimen shall be the same size as one that will produce a large one? The $1\frac{1}{4}$ inch and $1\frac{1}{2}$ inch test, therefore, will scarcely apply. Everyone who breeds Noctuæ of the *Agrotis* type must have noticed that we want something very much more definite than distinctness of markings and intensity of colour in determining similar larvæ. "*A. tritici* has the ends reduced." "*A. aquilina* is slightly reduced at second and last segments." These I suppose are the "ends." Hence I see no distinction here. In fact, until they are bred from eggs and not from captured larvæ, and until it has been proved that it is impossible to breed *A. aquilina* or *A. obelisca* from *tritici* eggs, and *vice versâ*, I maintain that we have no right to confuse the younger entomologists or disgust the older. New species are not so important as entomological science, and doubtful species had better be left alone, as far as lists and names are concerned, until they are no longer doubtful. With all due respect to Mr. Gregson's experience, I maintain that the illustrations of

G. obscuraria and *B. repandata* do apply (not perhaps in the exact way he puts it), and that the geographical variation must be taken into account when studying the geology of the locality of capture. What I maintain is, that in some places several shades and forms of these species may be obtained. In others, owing to peculiar circumstances, only one particular form is developed, and no other is found in the same district. I am sure many entomologists will be glad to hear of the occurrence of *A. similans* (*pyrophila*) over such a wide area; and I must congratulate Mr. Gregson on his great success in capturing this species. I have received private information of "one" having been taken in Shetland, and others a few years ago in the Isle of Portland.

I must confess Mr. Atmore's note puzzles me. I have taken some hundreds both of *tritici* and *nigricans* in many places, sometimes very commonly on the same ground, but I never saw a genuine *nigricans* in copulâ with *tritici*. I believe that in cases where it has occurred it has been unnatural. If, however, true *nigricans* copulate "freely" with *tritici*, we have another question yet to work out, which our present knowledge of these species does not touch.

I am inclined to hold the same opinion as Mr. Gregson with regard to the Shetland varieties of *A. cursoria*. All I have seen have struck me as being much more probably *A. tritici* than *A. cursoria*; but I suppose this form has not been bred from eggs.

Rayleigh Villa, Westcombe Park, Blackheath, S.E., June, 1885.

NOTES ON THE CAPTURE AND PRESERVATION OF COLEOPTERA.

BY LYONELL FANSHAWE.

(Concluded from p. 139.)

III.—COLLECTING IN SUMMER AND AUTUMN.

IN the summer months very many species may be collected by beating and sweeping trees, flowers, grass, and all descriptions of herbage. The net should be drawn lightly but thoroughly over the herbage, and with an upward motion of the hand, taking care not to entangle it in the brambles when passing. Unless it is examined pretty frequently there will be such a confused mass

of beetles, small moths, spiders, flies, petals of flowers, &c., as it will be almost impossible to separate. It is a good plan to sweep only one sort of plant at a time if possible, for by that means the food plant of the beetle can be correctly ascertained. A hayfield is a certain place for a successful hunt, especially on a sunny day in June or July, when the flowers are all in blossom. A hawthorn bush in full bloom is a well-known attraction for beetles, and indeed for all orders of insects. The net or umbrella should be held under each of the flowering boughs in turn, the boughs smartly tapped with a stick, and the net examined after each tap. Most of the species of *Meligethes* and *Epuræa*, and many others, may be easily secured in this way. Sallow blossoms, reeds, flags, rushes, fern, heather, nettles, turnips, and clover, are very productive plants, and all yield their various particular species. Many of the *Donaciæ*, *Stenidæ*, and *Chrysomelidæ*, may be taken from plants by the water in various parts of the country.

A plan by which I have captured many night-flying species is to place several open pots or basins in fields or woods, in which is some beer mixed with rum and sugar. The beetles smell the mixture, and fly or crawl to it during the night, and, when once in, few escape from the sticky compound. The drawbacks to this are that a quantity of other insects are caught, and also that the beetles become so clogged that it is sometimes rather difficult to clean and prepare them for the cabinet; nevertheless it is well worth trying. Small sticks should be placed against the outside to enable the beetles which do not fly to get in.

As the season advances sweeping may still be carried on, indeed till quite late in the autumn. Also hunting in ponds, under bark, dead leaves, moss, and the like, as many species take up their winter-quarters early, especially if the autumn be a cold one. The blossoms of ivy and privet attract many beetles, and they should be carefully examined.

September, of course, is the great month for sugaring for moths, and when the collector is searching for them on the trees he should keep a sharp look out for Coleoptera also. Many night-flying beetles are caught when "light" is being used for moths. By "sugar" and "light" many species are caught which, on account of their being night-flyers, would not otherwise be taken.

Fungi, especially when decaying, are certain to contain

quantities of specimens, chiefly Brachelytra and Necrophaga; and whenever a fungus is found it should be pulled to pieces over a sheet of white paper.

The beetle hunter should never be without either a small bottle or a few pill-boxes, for, even if not out collecting, something or other will be almost certain to turn up which he wants, and, not having any means of bringing it home, he will be obliged to leave it.

An "Entomological Diary" ought to be kept regularly by every collector. It should be ruled into four or five columns, containing the date of capture, locality, number of each species caught, and any particulars worth recording. Each specimen, of course, as before stated, would have a number or mark attached corresponding to the one in the book.

I think I have now given the most important hints to enable anyone to start on this most interesting study, and only hope that these few short and imperfect notes may be the means of inducing some of the many readers of this paper to begin the fascinating occupation of beetle-hunting.

2, Halkin Street West, Belgrave Square, London, S.W., June 8, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTES FROM CORK.—Some few things which I have noted here in the past three seasons appear to be sufficiently curious to be submitted for publication. *Lycæna icarus* is said, in all the books I have read, to be double-brooded, the first brood in May and the next in August. This is true enough for England, but here there is only one appearance, that is the August one. I may say this with certainty, for in April, May and June I have carefully ransacked the localities where they abounded in August. Similarly *Cænonympha pamphilus* is here seen only during the last half of June, and then completely disappears. This is not, I think, the effect of the failure of a brood. A strange circumstance occurred here on March 3rd last, which was an unusually fine day. A single *Pararge ægeria* was seen by me and my friends flitting about a woody roadside. This species does not hibernate, so it must have been an

arrival tempted to emerge by the spell of hot weather. I think my locality is more remarkable than that of Mr. Harding, for *Melitæa aurina* (Entom. xviii. 147), as, although there was a marsh within a mile, it was in the valley beneath, and it is a matter of wonder that so weak-winged a butterfly should have scaled such a steep hill.—HARRY C. SANDFORD; Bellevue Park, Military Road, Cork.

CAPTURES IN SOUTH STAFFORDSHIRE.—Perhaps the following notes from this part of the country, during 1884, will prove interesting to your readers. On May 12th, and other days following, I found the larva of *Abraxas grossulariata* very abundant on currant and gooseberry bushes. In June I found several broods of larvæ of *Vanessa urticæ* on the stinging-nettle; also about a dozen larvæ of *Halia vernaria* (*wavaria*), feeding on a currant bush. On June 4th I visited Bewdley Forest, and found *Argynnis euphrosyne* very abundant. I captured seventeen specimens in about an hour; also one specimen of *Melitæa aurinia* (*artemis*), six *Cænonympha pamphilus*, and two of *Venilia maculata*. I saw several *Euchloë cardamines*, one *Vanessa cardui*, and one *Gonepteryx rhamni*. I also found several cocoons of *Zygæna filipendulæ*. Rain coming suddenly on, I had to close my net and wend my way back to the town through a drenching shower. In the country around Wolverhampton during the past season, I have noticed that *Vanessa atalanta* and *V. cardui* were in great abundance, in the perfect state more so, *V. atalanta* in the larva state, during the month of August. A friend and I collected upwards of two hundred larvæ of *atalanta*, seeing besides several *V. cardui* flying, which species I saw as late as the middle of October. On August 7th I saw a remarkably fine specimen of *Macroglossa stellatarum* flying in my garden, the first specimen I ever saw in this part of the country. On August 14th I saw four *Vanessa io* in a clover field not far from Wolverhampton. I was much pleased with the sight, having never before seen one alive in these parts. During the season my friend captured twelve specimens of *Plusia iota* and three of *P. festuæ* at Ashmore Park. I noticed through the past season the following species in some plenty, *Melanippe montanata*, *Noctua triangulum*, *Plusia gamma*, *Acidalia aversata* (the banded variety being about one in three), *Hadena pisi*, *H. oleracea*, *Triphæna pronuba*, *Phlogophora meticulosa*, *Xylophasia*

lithoxylea, and many others. The larvæ of *Pieris brassicæ* and *P. rapæ* were very plentiful in August and September, and proved very destructive in gardens about here. On July 13th I noticed *Epinephele ianira* and *Cænonympha pamphilus* in great abundance around Kinver Edge.—THOMAS HILL; March End, Wednesfield, near Wolverhampton.

ARCTIA MENDICA FEEDING ON BIRCH.—Is it generally known that *Arctia mendica* sometimes feeds on birch? Early in June last year, whilst Mr. George Tindall, of Doncaster, and I were searching for larvæ of *Phycis betulella* in the Green Farm Wood, Doncaster, Mr. Tindall found a batch of eggs on a birch leaf. Not being aware that *mendica* fed in a wild state on anything but low plants, we did not recognize to what species they belonged, so at Mr. Tindall's suggestion I reared them. The young larvæ took readily to birch, and soon proved themselves to be a batch of *mendica*. Even then we supposed the circumstance to be accidental until the 30th of May last; whilst again collecting larvæ of *P. betulella*, on the same ground, another batch of eggs of *mendica* was found on a birch leaf, and near it was soon afterwards secured a moth of this species. The larva of *Arctia lubricipeda* is often found feeding high up on trees, and it is evident that its cousin *mendica* sometimes gets "higher notions" as well. It may be added that larvæ of *P. betulella* were plentiful, and we also took a few of *Coleophora currucipennella*.—GEO. T. PORRITT; Huddersfield, June 18, 1885.

ACRONYCTA ALNI.—In the latter part of September, 1884, I took a larva of *A. alni* feeding on willow, which pupated the following month, spinning up in the leaves of its food-plant. The perfect insect appeared on the 4th of June, 1885.—C. K. TERO; B 32, Kent Street, Grimsby, June 24, 1885.

ABUNDANCE OF TORTRIX LARVÆ.—During the last few seasons Lepidoptera seem to have occurred in less numbers than of old. This year, however, I have noticed many oak trees quite bare of leaves, chiefly owing to the devastations of *Tortrix viridana* larvæ. When riding through some oak woods at Warley, on Saturday last, a loud cawing of rooks attracted my attention, and on looking up I witnessed a sight entirely novel in my experience. There, on the topmost branches of a fine old oak, whose few remaining leaves were twisted up, and doubtless

contained larvæ or pupæ of Tortrices, were something like a hundred rooks, far away from their usual haunts, and hard at work on their unwonted delicacy. They took to flight at my approach, but went no further than a neighbouring oak, whence they would no doubt return soon afterwards to finish their repast. Perhaps some of your readers may have observed rooks feeding on small larvæ, but to me the sight was strange and interesting.—(Rev.) G. H. RAYNOR; Shenfield, Brentwood, June 22, 1885.

MIMÆSEOPTILUS PLAGIODACTYLUS.—Mr. Gregson has been good enough to send me a few more larvæ of this species. They came to hand June 5th; all were then full fed, some of them, in fact, just on the point of pupating. As on former occasions, when sending me larvæ of *M. plagiodactylus*, Mr. Gregson called my attention to the absence of "claret-coloured dorsal stripe." Hitherto I have failed to agree with Mr. Gregson in this matter, but examination of this last batch has conclusively proved the absence of dorsal markings of any shade of either red or brown. Although there was no trace of such markings on the larvæ up to almost the last moment of their active existence, I observed that shortly after they had taken up their position to effect their pupal transformation, a slight rosy suffusion of the anal segment occurs, and that each pupa developed the pink or rose-coloured dorsal markings more or less strongly. One pupa under notice at the present moment is suffused over the whole dorsal area with rose madder. Up to the time of penning this note two imagines have emerged, and they are undoubtedly fine strongly marked *M. plagiodactylus*, or perhaps it would be more correct to write *bipunctidactyla*. I should add that the individuals of this, the third consignment of *M. plagiodactylus* larvæ from Mr. Gregson, differ only from those of the first and second batches sent me by the same gentleman in the matter of dorsal ornamentation; in all other respects they are identical.—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood, N.W.; June 20, 1885.

PLATYPTILIA GONODACTYLA.—I did not, when I wrote the note published in last month's issue, know that Mr. Gregson had bred the larva he mentioned as feeding on the undersides of the leaves of *Tussilago farfara*, and which he supposed might be *Pterophorus farfara*, and until I read Mr. South's note last week I was under the impression he had not. Did Mr. Gregson

describe the larva which he reared? If so, did it agree with the continental descriptions of *P. farfara* larvæ? or did it materially differ from *P. gonodactyla* larva of the first brood? If it agreed with *P. farfara*, and did not materially differ from *P. gonodactyla*, it would go a long way to bearing out Mr. South's suggestion that it may be a "seasonal form" of *P. gonodactyla*, or in other words that it is to be referred to the second brood of *P. gonodactyla*, for such I take this phrase to mean. Again, have the continental authorities noted *P. gonodactyla* as double-brooded? and does *P. farfara*, of Zeller, appear on the Continent in the same places as *P. gonodactyla*, and at a time corresponding with a second brood of that species?—J. W. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E., June 9, 1885.

FOSSIL INSECTS.—At a meeting of the Geologists' Association, held at University College on the 5th of June last, Mr. Herbert Goss, F.L.S., F.G.S., read a paper "On some recently discovered Insecta and Arachnida from Carboniferous and Silurian Rocks." After remarking on the great number of Palæozoic insects lately discovered, and calling attention to the recent investigations and writings on the subject of M. Chas. Brongniart, Dr. Deichmüller, Dr. Dohrn, Dr. Fritsch, Dr. Eugen Geinitz, Dr. H. B. Geinitz, Dr. Goldenberg, Dr. Hagen, Prof. Lindström, Dr. Novak, Mr. B. N. Peach, Mr. Scudder, and Dr. Sterzel, the author stated that at the date of his last paper in March, 1879, only 103 fossil insects from the Carboniferous rocks of the whole world were known; but that during the last five years a large number had been discovered, including about 1400 from the Coal-measures of Commeny, France, and a few from Saarbrück, Kleinopitz, Lugan and elsewhere in Germany, and a considerable number from various parts of the North American continent. Such of the specimens as had yet been determined were then enumerated, some of the most remarkable forms were referred to in detail, and attention was drawn to their affinities with existing types. According to M. Brongniart, the Commeny fossils included about forty types. The Hemiptera are represented by genera allied to *Fulgora*, *Lystra* and *Membracis*; the Neuroptera by forms approaching *Corydalus*, *Chauliodes* and *Hemerobius*; the Pseudo-Neuroptera by types closely allied to *Ephemera* and *Perla*; and the Orthoptera by *Blattidæ* and *Phasmidæ*. Many of these fossils, could not,

however, be referred to any existing order, but belonged to some synthetic or homogeneous types uniting in themselves characteristics of Neuroptera and Orthoptera, or Neuroptera and Hemiptera, proving that at this early period the differentiation of many of the existing groups was not completed. Attention was then called to the discovery last year of fossil scorpions (insectivorous animals) in the Upper Silurian of the Isle of Gothland and Scotland, and of the wing of a cockroach in the middle Silurian of Jurques, Calvados, France. Prior to these discoveries no remains of terrestrial animals had been discovered from any strata older than the Devonian, and the result of the discovery of this cockroach in Silurian strata was to leave the insects the oldest known class of land animals, and the *Blattidæ* the oldest known family of insects. The paper concluded with a summary of the results of recent discoveries, and it was stated that the evidence afforded by Palæontology was, as far as it went, in support of the views as to the origin of insects and the order of succession on the earth of the various groups arrived at by Dr. Packard and others from a study of the embryology of the class. No evidence had, however, yet been obtained of the existence of any earlier forms connecting the Insecta with those lower groups from which they are, by many biologists, believed to have originated.

ENTOMOLOGICAL COLLECTIONS AT THE U.S. NATIONAL MUSEUM.—We understand that Prof. Baird, Director of the U.S. National Museum, has decided to appoint an assistant Curator of the Department of Insects in that Museum, at a salary of 1500 dollars per annum, and that Prof. Riley, the honorary curator, in view of the fact that this action will secure the permanent care of collections, in case of his death or removal from Washington, has decided to turn over to the Museum all his own collections, the larger part of which are already deposited in the Museum. It may be of some interest to learn how much of a collection the National Museum can at present boast of. From data kindly furnished by Prof. Riley, the following has been compiled. 1st. Collection C. V. Riley, 17,725 species with 115,058 specimens, divided as follows:—Hymenoptera 2550 species, 24,796 spec.; Coleoptera 9058 species, 48,618 spec.; Diptera 699 species, 5646 spec.; Lepidoptera 2368 species, 17,098 spec.; Hemiptera, 1134 species, 8862 spec.; Orthoptera, 560 species, 6903 spec.; Neuroptera, 160 species, 868 spec.;

Arachnidæ and Myriapoda 110 species, 425 spec.; Galls and Gall insects, 734 species, 4152 specimens; the balance miscellaneous and Insect Architecture. There is also an alcoholic collection, principally of adolescent states, containing 2850 vials, and a collection of some 3000 slides of minute insects and larvæ mounted in Canada balsam. 2nd. Collection of Department of Agriculture. Containing a large lot of material accumulated in the practical work of the division, and by the collection of its employées. It contains about 5000 species—mostly exotic—not in the Riley collection. 3rd. Collection of the National Museum. This is the poorest of the lot, and consists principally of the material sent in during the past three years from all sources. There are about 2000 species not in either of the other collections. 4th. The exhibit collection of Economic Entomology prepared for the New Orleans Exhibition, valuable for its economical interest. A catalogue of this has been printed. This forms a good nucleus, and in charge of a competent and enterprising curator it will quickly take rank as one of the most important in the country. The large collection of larvæ forms a distinct and decided addition to its value.—‘*Entomologica Americana*,’ June, 1885.

REVIEWS.

Entomologica Americana. Vol. I., No. 1. Brooklyn, N. Y. April, 1885.

THIS, the newest of entomological serials, is to be the organ of the Brooklyn Entomological Society, and absorbs the ‘Bulletin’ of that Society and ‘Papilio,’ both being discontinued in favour of this monthly magazine, which is to be edited by Mr. John B. Smith, with the assistance of a publication committee of four other members. We also gather that Prof. C. V. Riley, the U. S. Entomologist, is giving his support; so that “a future” may be expected for ‘*Entomologica Americana*,’ notwithstanding its inconvenient title.

Among the more important articles in the first number is one headed, “Synonymical Notes,” by Dr. George H. Horn, who takes for his subject certain species of Coleoptera, described by

Edward Newman, more especially the Cerambycidæ. The critical examination of the different species and their synonyms is carefully worked out, priority being rigidly maintained, and names of "long-continued use" being ruthlessly sacrificed. The species dealt with were described in 1838 ('Entomological Magazine,' vol. v.), 1840-2 ('Entomologist,' vol. i.), the 'Zoologist,' and in 'Charlesworth's Magazine.' Newman's names seem to be still accepted in the majority of instances. Dr. S. W. Williston has a technical paper on the classification of the Diptera of America; but the article of most interest to English readers is one by Mr. John B. Smith, on "Noctuids common to England and North America." This paper is a criticism of one which appeared in the 'Verh. K. k. zool. bot. Gesellschaft in Wien' last year, by H. B. Mœschler, upon the same subject. Mr. Smith deals with the genus *Agrotis* of Staudinger more particularly; and we find, among others, common to America and Europe, several of our old British friends, such as *augur*, *festiva* var. *conflua*, and *segetum*. Mr. Smith doubts the identity of these with the American representatives; but he agrees with the eleven other species of the genus common to both continents, among which we find *baia*, *c-nigrum*, *plecta*, *fennica*, *saucia*, *upsilon*, and *occulta*.

This subject of distribution of species is of great interest, as showing to what extent species may become changed or modified when long separated in far distant localities, and to what extent the so-called species of American insects are really good species, or only sub-species of previously known insects in the "Old World."—J. T. C.

Elementary Text-book of Entomology. By W. F. KIRBY. Large square 8vo, with 87 plates and 650 figures. London: Swan Sonnenschein & Co. 1885.

THIS work again takes us over paths already trodden, but makes them more interesting by illustration. The letterpress extends to 240 pages, including an introduction. Though most of our readers will be familiar with the subjects treated in the introduction, these will bear re-reading; and many will find both instruction and amusement in perusing the dozen or so pages devoted to that section of the work. The more recent discoveries

in the habits of insects are recorded, and the facts are pretty well up to time. It is interesting to know that Mr. Kirby estimates the number of species of insects of all orders, as yet identified throughout the world, at 220,000, out of which about 12,000 are known to inhabit England.

“Nor let anyone imagine that our British Fauna is by any means exhausted. It is true that the British Coleoptera and Lepidoptera have been so far investigated that a man must work very hard before he can hope to add a new British species to either order; but any entomologist who cares to take up any of the less studied groups of any of the other orders may rely on adding a considerable number of new species to the British Fauna, a certain proportion of which will be new to Science. Even among our commonest insects the habits and structure of any one species would furnish any person, with a taste for such pursuits, with sufficient employment for a lifetime. The collectors province may be exhausted in a few years; but the observers, never.”

The treatment of the separate orders in the body of the work is concisely managed, and generally satisfactory. The plates are sufficient for the purpose for which they are required, though by no means up to the standard of modern work. If a portion of the illustrations had been devoted to the characteristic anatomy of the various orders, it would have added to the scientific value of the work; and had the figures of the Lepidoptera been favoured more generally with legs as well as wings, we should have thought them more representative.—J. T. C.

OBITUARY.

The late Mr. THOMAS COOKE was among the best known entomologists of the past generation. He was born in 1814; and founded the well known natural-history agency now in Museum St., London, in 1853. His genial temperament had made him many friends; but latterly he had of necessity retired from active life from the affliction of paralysis, with which he was stricken more than eight years ago, and since then he has been confined to his bed. He died on the 10th of June, 1885. Mr. Cooke has not, that we are aware, added much to the written history of insects. He was a member of the Haggerston and West London Entomological Societies.

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[No. 267.]

NOTES FROM EPPING FOREST.

BY GEORGE V. ELSTOWE.

THERE is nothing so disheartening to the young collector than a continuous east wind, rendering most species scarce upon the wing, and generally those he is most in want of for the formation of his young collection. Such were my feelings on a temporary stay at Loughton, during which I spent considerable time in the adjoining Forest, with the intention of adding to my collection several good species, generally looked upon as easily procurable there, and of finishing my series of many common things.

I had noticed in the 'Entomologist' (Entom. xviii. 88) that Mr. Wright—who appears to have worked that part considerably—gave reasons for expecting a better show of Lepidoptera during this spring and summer than has been seen for some seasons back; and, taking the result of my collecting altogether, I must admit that, to a certain extent, his arguments have been in the main verified. However, I found the cold winds of May and June very tantalizing; and although during the day the sun shone warmly, the temperature after sunset fell considerably, owing to the prevailing direction of the wind. Although few things appeared in flight, yet I made up in a small measure during early May by diligent searching, both in the daytime and evening, and was rewarded by finding several good *Anticlea badiata* and *A. nigrofasciaria (derivata)*, both apparently late in appearing, as their good condition indicated. I also noticed that

almost every species this year has been backward, and has continued so almost up to the present. This I found especially with regard to those species due to appear at the end of May and in early June.

During the second week in June *Drepana cultraria* (*unguicula*) was out in fair numbers, although it required considerable bough-beating to obtain a satisfactory series; and at the same time *Zonosoma linearia* (*trilineararia*) and *Nola confusalis* (*cristulalis*). I was very pleased to see numbers of *Z. punctaria*, very little labour being required to obtain a satisfactory series from the pollard oaks round the Old Roman Encampment. Also *Odontopera bidentata*, which appears to brave any weather. *Drepana falcataria* (*falcula*) and *D. lacertinaria* (*lacertula*) were visible; the former about Epping Thicks sparingly, and the latter at High Beech somewhat more liberally. Also *Macroglossa fuciformis* round a cultivated patch of garden; and whilst working the birches round Epping Thicks I was very pleased to take seven *Sesia culiciformis*, and also saw the tunnels of probably *Trochilium carbroniformis* (*bembeciformis*), although of this latter I am not quite sure, as I understand there is a beetle which burrows in sallows in much the same way as *T. carbroniformis*; I did not succeed in obtaining either pupa or imago of it. I also took *Acronycta leporina*, which I believe is a rarity. This last-mentioned locality seems a promising one for future working, the trees having been thinned considerably; but the recent felling, however much it may be regretted in other ways, will allow of a richer growth on the ground, permit the trees to expand, and facilitate locomotion.

In conversation with other collectors whom I met I learn that considerable disapproval is rife regarding the large numbers of trees being felled in this and other parts of the Forest, but it is my opinion that it is but sacrificing the present for the future, and that in a few years this part especially will well repay a visit. In fact, this locality repaid me better than any other I worked, as I was successful in finding there *Stauropus fagi*, and some weeks before a like number of *Asphalia flavicornis*. The first *S. fagi* which I found struck me as presenting an odd figure, although I daresay the peculiarity has often been observed before, *viz.*, that when at rest upon the tree trunk it pushes its hind legs underneath and in front of the fore ones. While

beating the oaks for *Zonosoma punctaria* round by the Roman Camp I was surprised and pleased to net *Drepana binaria* (*hamula*), and it was not long before I had a good series. I observed several cripples of this species on the tree trunks and on the grass, and it struck me as peculiar that it was usually the left hind wing that was either incomplete or totally wanting.

On the beech trees adjoining I obtained a few *Eurymene dolobraria*, and *Dasychira pudibunda* in couples were not wanting, although apparently very late, having observed one as recently as July 3rd. During May I took one *Amphydasis strataria* (*prodromaria*) and several *A. betularia*; also *Lophopteryx camelina*, and, in goodly numbers, *Hylophila prasinana*, the former on the trunks and the latter clinging to the leaves of the oaks bordering on the plain at Theydon. I was also surprised to find *Erastria venustula* in greater numbers than I had expected, having no difficulty in obtaining a good and well-marked series in two evenings at the latter end of June. This moth, I understood from a local collector, who considered it a good species, was to be had but sparingly, and although I failed to find the spot indicated by him, yet I was not disappointed while working for it about half way between Theydon Bois and Loughton. It, however, is not one of the easiest species to capture, as it requires close watching and a quick hand, as its flight is quick and short. I also succeeded in obtaining some ova, which hatched in eighteen days, and the larva now strongly resembles that of a small sawfly, rolling itself into a flat compact ring when disturbed. I have endeavoured to get them to eat various wild flowers, but find that they will only touch those of blackberry and *Tormentilla reptans*, which, I am inclined to believe, is the true food-plant.

At the same time and place I found *Numeria pulveraria*, although not in any numbers, and while working round the crab trees near Theydon I obtained several *Eupithecia rectangularata*, among which were two very dark varieties, in fact almost black, and very different from the beautiful dull green of those which I took in the New Forest the year before.

As June drew on the weather showed signs of improvement, and until the last week, when the east wind returned, I succeeded in taking no less than thirty-seven species, many of course common, but some worthy of mention:—*Melanippe procellata*,

M. sociata (subtristata), *Emmelesia albulata*; and at sugar two *Dicycla oo*; also *Thyatira batis*, *T. derasa*, and *Cymatophora duplaris*; and as July drew on, *Dipterygia scabriuscula* (pinastri); and among those to be mentioned as numerous were *Noctua augur*, *N. festiva*, and *Aplecta nebulosa*. Among the Geometræ were *Emmelesia decolorata* (near Ongar), *Larentia didymata*, *Pericallia syringaria* (although small), and *P. pustulata* (bajularia).

Among larvæ I did not do much; being only a temporary resident, I found it difficult to devote the time and space for their occasional feeding. However, I noticed several worth mentioning, especially towards Ongar; in a small wood I found three *Notodonta chaonia*, two *N. trimacula* (dodonea), and a few *Euchelia jacobææ*, although the latter I observe, in a recently published guide to the Forest, is mentioned as scarce.

During my rambles in the daytime I noticed a fair number of species belonging to the Diurni, but could not help remarking that many of them were very restricted in locality. *Argynnis euphrosyne* I found plentiful in two places, but away from those I did not see it; the same may be said of *A. selene*. *Lycæna argiolus*, at the north side of Epping Thicks, where the holly is very prolific, was occasionally to be met with; and also *Pararge megæra*, but sparsely. In the low-lying districts *Nisoniades tages* and *Syrichthus alveolus* were plentiful; but beyond one *Colias edusa* I saw scarcely anything but the common whites. *Thecla quercus* larvæ, although plentiful at oak near Theydon, did not appear in any numbers on the wing; and of *T. betulæ* I found a great difficulty in obtaining a few larvæ; but as I hear that it is sometimes plentiful, I conclude that this is a year of a scarcity.

The foregoing, although not exhaustive, will therefore show that species generally could not be considered as very plentiful, yet there was sufficient to repay a diligent collector; and, properly worked by anyone living in the neighbourhood, I feel sure that a splendid nucleus for a good collection might be obtained from the Forest alone; and, doubtless, through want of a better knowledge of the localities, I failed to get many of the good things which it contains.

July 27, 1885.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. V.—OPHIONIDÆ (*continued*).

C. Abdomen red and black; scape pale (red or yellow) beneath.

A. Hind femora red, or greater part so.

a. Hind tibiæ red, or apex dark.

* Hind coxæ red, aculeus rather less than half of abdomen (male and female).

† Post-petiole transverse or subtransverse. - *litoralis*, 2—2½ lines.

†† Post-petiole elongate or subquadrate.

Head behind the eyes dilated; hind coxæ generally fusco-maculated. - - - 38. *hydropota*, 1½—2 lines.

Head behind the eyes not dilated; coxæ entirely red.

63. *rufiventris*, 2—2½ lines.

** Hind coxæ partly red.

† Aculeus of female short, base of antennæ reddish.

ruficornis, 2—2½ lines.

†† Aculeus of female rather less than half of abdomen.

§ Post-petiole longer than wide, or subquadrate (male and female).

38. *hydropota*, 1½—2 lines.

§§ Post-petiole transverse or subtransverse (female).

litoralis, 2—2½ lines.

*** Hind coxæ black; aculeus short.

o Abdomen red, base black. - - 56. *paludicola*, 2—2½ lines.oo Middle of abdomen red. - - - 45. *longipes*, 2—2½ lines.

ooo Incision of two sides of 3rd and belly of 4th to 6th segments red.

erythropyga, 2—2½ lines.oooo Apex of segments 2nd to 4th red; 5th red; base of back black; 6th and 7th towards the belly red. - 5. *alternans*, 2 lines.

b. Apex and before the base of hind tibiæ more or less dark.

* Aculeus of female about half of abdomen.

† Margin of 3rd to 7th segments and sides pale.

50. *multicincta*, 2—2½ lines.

†† Segments 3rd to 6th chestnut, with black dorsal marks.

46. *maculata*, 3 lines.

** Aculeus rather less than 1st segment of abdomen.

More or less of apex of 1st, 2nd, and 3rd segments red.

barrettii, 3 lines.

*** Aculeus very short.

† Head buccated; sides of abdomen sometimes red-marked (male and female). - - - *clandestina*, 2¼—3 lines.

†† Head narrow behind the eyes; 3rd to 7th segments partly red; extreme base of hind tibiæ yellowish (male and female).

9. *argentata*, 2½—2¾ lines.

c. Base and apex of hind tibiæ dark.

* Head narrow behind the eyes; aculeus of female very short.

† Hinder coxæ black.

† Front coxæ reddish yellow.

§ 1st, 2nd, and 3rd segments red-margined. - *tricincta*, 3 lines.

- §§ 2nd and 3rd segments red-margined. 13. *bicingulata*, 2—2½ lines.
 †† Front coxæ black.
 Female apex of 2nd segment, male apex of 2nd and 3rd, red; the red more or less obsolete sometimes. 21. *crassiuscula*, 2½ lines.
 †† Hinder coxæ red. - - - - 71. *unicincta*, 3 lines.
 ** Head buccated. - - - - *erythropyga*, var.
 B. Hind femora black.
 a. Aculeus of female about as long as 1st segment.
 Scape beneath red; abdomen red; petiole, 2nd to 7th or 4th to 7th segments with dark dorsal marks, or abdomen almost entirely red; hind tibiæ black, middle testaceous, base whitish.
 48. *melanosticta*, 2 lines.
 b. Aculeus very short; middle of abdomen more or less red; apex of hind tibiæ fuscous.
 * Claws of hind tarsi pectinated at the base; sides of head behind the eyes parallel; teeth of mandibles unequal.
 35. *fulviventris*, 2—2½ lines.
 ** Claws of hind tarsi distinctly pectinated; sides of head somewhat slanting; teeth of mandibles subequal. *pagana*, 1½—2½ lines.
 D. Abdomen red and black; scape black beneath.
 A. Hind femora red.
 a. Hind tibiæ red, or apex more or less dark.
 * Hind coxæ red.
 Aculeus longer than 1st segment; middle of abdomen red; head subbuccated. - - - - *litoralis*, 2—2½ lines.
 ** Hind coxæ fusco-maculated.
 Middle of abdomen red, head much buccated; aculeus less than half of abdomen. - - - - 38. *hydropota*, 1½—2 lines.
 *** Hind coxæ black.
 † Front coxæ pale.
 Middle of abdomen red (see above); stigma pale. 38. *hydropota*, var.
 † Aculeus of female one-third of abdomen; stigma fuscous.
rufata, 2—2½ lines.
 †† Aculeus of female very short. - - - - 43. *insidiator*, 2½ lines.
 †† Front coxæ black; in the male of *rapax* more or less red.
 § Aculeus short.
 o Aculeus hidden. - - - - *canaliculata*, 2½ lines.
 oo Aculeus projecting.
 × Extreme base of hind tibiæ whitish. 54. *notata*, 2½—3½ lines.
 × × Base of hind tibiæ not whitish; aculeus rather longer than *notata*.
 59. *rapax*, 2½—2¾ lines.
 §§ Aculeus about as long as the 1st segment of abdomen.
 + 2nd segment of abdomen transverse. 15. *brevicornis*, 3—3½ lines.
 + + 2nd segment of abdomen not transverse.
 ++ Aculeus longer than the 1st segment. 20. *crassicornis*, 2¾—4 lines.
 +++ Aculeus less than the 1st segment. - 6. *alticola*, 2¾ lines.
Males only.
 3rd segment red, base black; 4th, apex and sides red; 2nd segment more than twice as long as wide.
 17. *carnifex*, 2½—3½ lines.
 Abdomen red; petiole only black. - - - - *rufa*, 4 lines.
 b. Base and apex of hind tibiæ dark.

- * Front coxæ more or less pale.
- † Sides of segments reddish chestnut; aculeus rather longer than 1st segment; middle of hind tibiæ white.
- †† Middle of abdomen red. (See above.) - - - *assimilis*, nearly 3 lines.
- ** All the coxæ black.
- ‡ 3rd segment and sides of rest chestnut; middle of hind tibiæ red; aculeus very short. - - - - - *cædator*, 2—2½ lines.
- †† Middle of abdomen red.
- § Head behind the eyes not narrow.
- Aculeus very short; middle of hind tibiæ red.
- 12. *auctor*, 3½—4 lines.
- §§ Head behind the eyes narrow; aculeus very short.
- 24. *dolosa*, 3—3½ lines.
- c. Apex and before the base of hind tibiæ dark.
- * Middle of hind tibiæ whitish.
- † Extreme apical margin of segments reddish yellow; aculeus about half of 1st segment. - - - - - *concinna*, 5·5 mm.
- †† Middle of abdomen red; aculeus short. 60. *ruficincta*, 2½—3½ lines.
- †† Sides of abdomen red; aculeus about half of abdomen.
- Transverse anal nervure slightly geniculated.
- 26. *ensator*, 2½—3 lines.
- ** Middle of hind tibiæ reddish. - - - 54. *notata*, 2½—3½ lines.
- B. Hind femora dark.
- a. Hind tibiæ red, or apex dark.
- Aculeus short. (See below.) - - - 40. *incrassata*, var.
- b. Base and apex of hind tibiæ dark; aculeus short (male and female).
- * Head behind the eyes much wider at the back part than against the eyes.
- Middle segments red-margined. - - - *monticolana*, 2½ lines.
- ** Head not thus widened; middle of abdomen red, more or less black-marked.
- † Antennæ half the length of body; hind tarsi with short pectinations. - - - - - 40. *incrassata*, 2½—3 lines.
- †† Antennæ two-thirds the length of body; hind tarsi distinctly pectinated. - - - - - 12. *auctor*, 3½—4 lines.
- c. Apex and before the base of hind tibiæ dark.
- Sides of segments red-marked, sometimes the margins also, sometimes almost entirely black; aculeus longer than 1st segment of abdomen.
- * Aculeus of female half of abdomen (female).
- 70. *tumidula*, 2—2½ lines.
- ** Aculeus of female one-third of abdomen (male and female).
- 31. *femoralis*, 2½—2¾ lines.
- d. Hind tibiæ almost entirely dark.
- * Base of hind tibiæ white; aculeus very short. 49. *mæsta*, 3 lines.
- ** Base of hind tibiæ not white, middle sometimes reddish.
- 61. *rufimana*, 3—4 lines.

THE LEPIDOPTERA OF BURTON-ON-TRENT AND NEIGHBOURHOOD.

(Continued from p. 183).

NOCTUÆ.

Bryophila perla, Burton (E. B., W. G., and J. T. H.), Branston (J. E. N.), not common at Bretby (T. G.), common at Derby (G. B.), near Ashbourne (H. F. G.), common at Rugeley (R. F.).

Demas coryli, Dovedale (G. B.).

Acronycta tridens, common (E. B.), fairly common at Burton (G. B.), Barrow (G. A. S.). *A. psi*, common throughout the district. *A. leporina*, one near Willington (W. G.), Burton (P. B. M.), Stapenhill (G. B.), Ashby (G. A. S.). *A. megacephala*, tolerably common where poplars are found. *A. alni*, one at Knightley Park (E. B.), two larvæ taken (W. G.), one at Burton (C. F. T.), Stapenhill (G. B.), Eggington (Arthur Marshall), one in Repton Shrubs (J. E. N.), one in Hoofies Wood, near Hartshorne (T. G.), Ashby (G. A. S.). *A. ligustri*, Repton Shrubs, rare (E. B.). *A. rumicis*, common (E. B.), Derby (G. B.), Barrow (G. A. S.), common on Caunock Chase (C. F. T.).

Diloba cæruleocephala, common throughout the district.

Leucania conigera, The Lawns (E. B.), one larva (G. B.), Burton (J. E. N.), one at Bretby (T. G.), Barrow (G. A. S.), common at Rugeley (R. F.). *L. lithargyria*, Burton (E. B., G. B., J. E. N., and W. G.), Barrow (G. A. S.), one at Bretby (T. G.). *L. comma*, Henhurst, &c. (E. B. and W. G.), Burton (J. E. N. and G. B.), Bretby (T. G.), Barrow (G. A. S.), near Derby (H. F. G.), at light, at Rugeley (R. F.). *L. impura* and *L. pallens*, common throughout the district.

Cænobia rufa (*despecta*), Henhurst (E. B.).

Tapinostola fulva, common (E. B. and W. G.), Burton (G. B.), Bagots Park (C. F. T.), Bretby, 1881 (T. G.).

Nonagria arundinis (*typha*), common throughout the district. *N. lutosa*, Willington (E. B.).

Gortyna ochracea (*flavago*), common throughout the district.

Hydræcia nictitans, Henhurst (E. B.), Burton (G. B.), Bretby (T. G.), Rugeley, at light (R. F.). *H. micacea*, Burton, common (E. B. and W. G.), Burton, at light (C. F. T., &c.), one at Bretby (T. G.), Barrow (G. A. S.).

Axylia putris, common throughout the district.

Xylophasia rurea, common throughout the district. *X. lithoxylea*, The Oaks (E. B.), common on lime blossoms at Burton (C. F. T.), Burton (G. B.), Bretby (T. G.), near Derby (H. F. G.), Barrow (G. A. S.), Rugeley, common (R. F.). *X. sublustris* (?), one at Willington (W. G.). *X. monoglypha* (*polyodon*), common throughout the district. *X. hepatica*,

Henhurst, common (E. B. and W. G.), Burton (G. B.), Bretby (T. G.), Barrow (G. A. S.). *X. scolopacina*, Knightley and Bretby (E. B.), near Ingleby (W. G.), once at Shobnall (J. E. N.).

Neuria reticulata, Henhurst and Repton Shrubs (E. B.), once at Barrow (G. A. S.).

Neuronion popularis, Burton (E. B. and W. G.), twice at Bretby (T. G.), very common at Derby (G. B.), Rugeley (R. F.).

Charæa graminis, Bretby (E. B., T. G., and W. G.), Derby (G. B.), Cannock Chase, common (J. E. N. and R. F.), Charnwood Forest (J. T. H.).

Cerigo matura (cytherea), Knightley (E. B.), one at Barrow (G. A. S.).

Luperina testacea, Henhurst (E. B. and W. G.), Burton and Derby (G. B.), one at light, at Burton (J. E. N. and C. F. T.).

Mamestra anceps, Burton, at sugar (G. B.), Bretby, at sugar (T. G.), Barrow (G. A. S.). *M. brassicæ*, common throughout the district. *M. persicariæ*, near Derby (E. B.), common at Derby (G. B. and H. F. G.), once at Burton (W. M. A.), common at Rugeley (R. F.).

Apamea basilinea and *A. gemina*, common throughout the district. *A. unanimitis*, common at Burton (G. B.). *A. didyma (oculea)*, common throughout the district.

Miana strigilis and *M. fasciuncula*, common throughout the district. *M. literosa*, Willington (W. G.), Derby (G. B.), Barrow (G. A. S.). *M. arcuosa*, Henhurst (E. B. and W. G.), Bretby (T. G.), Repton Shrubs (G. B.).

Grammesia trigrammica (trilinea), common (E. B. and W. G.), Burton (J. E. N. and G. B.), Derby (G. B.), Bretby (T. G.), Barrow (G. A. S.), Ashborne (H. F. G.). Variety *bilinea*, Derby (G. B.).

Stilbia anomala (?), one at Findern (W. G.).

Caradrina morpheus, common throughout the district. *C. alsines*, Barrow (G. A. S.). *C. taraxaci (blanda)*, Derby (G. B.), Barrow (G. A. S.). *C. quadripunctata (cubicularis)*, common throughout the district.

Rusina tenebrosa, one in Repton Shrubs (W. G.), Cannock Chase, common (T. G.).

Agrotis suffusa, common some years. *A. saucia*, Somershall, rare (E. B.), one near Willington (W. G.), Burton, at sugar (C. F. T.). *A. segetum* and *A. exclamationis*, common throughout the district. *A. nigricans*, Derby (G. B.), Barrow (G. A. S.), two at Bretby, 1884 (T. G.). *A. tritici*, Barrow (G. A. S.). *A. aquilina*, The Lawns (E. B.), one specimen (W. G.), once at Bretby (T. G.). *A. obelisca*, bred from larvæ taken at Derby (G. B.). *A. agathina*, Breadsall Moors (G. B.). *A. strigula (porphyrea)*, Cannock Chase (C. F. T.), Breadsall Moors (G. B.). *A. obscura (ravida)*, Burton, rare (E. B.), Barrow (G. A. S.). *A. simulans (pyrophila)*, Somershall, rare (E. B.).

Noctua augur, common throughout the district. Variety *helvetina*,

has occurred near Derby (G. B.). *N. plecta* and *N. c-nigrum*, common throughout the district. *N. triangulum*, Henhurst (E. B. and W. G.), once at Bretby (T. G.), larvæ common in spring (G. B.). *N. brunnea*, Henhurst (E. B.), Willington (W. G.), Burton (C. F. T.), Little Eaton, common (J. E. N.), one at Bretby (T. G.), larvæ found in spring (G. B.). *N. festiva*, common throughout the district. *N. subrosea*, once at Little Eaton (G. B.). *N. rubi*, common throughout the district. *N. umbrosa*, larvæ on seeds of wild hyacinth (W. G.), at sugar, at Burton (C. F. T. and J. T. H.), Bretby, common (T. G.), Barrow (G. A. S.), Little Eaton (H. F. G.). *N. baia*, The Oaks and Henhurst (E. B. and W. G.), Bretby, at sugar (T. G.), once at Barrow (G. A. S.). *N. xanthographa*, common throughout the district.

Triphæna ianthina, Henhurst (E. B.), Burton (G. B.), fairly common at Bretby (T. G.), Barrow (G. A. S.), fairly common at Rugeley (R. F.), frequently flying by day (W. G.). *T. fimbria*, Henhurst (E. B.), Willington (W. G.), larvæ at Waterloo Clump, Repton Shrubs, and Tatenhill (G. B.), occasionally at Bretby (T. G.), Little Eaton (H. F. G.), Rugeley, but rare (R. F.). *T. interjecta*, Willington (E. B.), scarce (W. G.), Burton (G. B.), Barrow (G. A. S.), Rugeley, but rare (R. F.). *T. comes (orbona)* and *T. pronuba*, common throughout the district.

Amphipyra pyramidea, Burton (E. B. and J. T. H.), Repton (W. G.). *A. tragopogonis*, common throughout the district.

Mania typica and *M. maura*, common throughout the district.

Panolis piniperda, one at Knightley Park (J. T. H.).

Pachnobia rubricosa, Burton churchyard (C. F. T.), Bretby (T. G.), Repton Shrubs (J. E. N.), Little Eaton, common (G. B.). *P. gothica* and *P. incerta (instabilis)*, common throughout the district. *P. populeti*, Henhurst (E. B.), near Branston (J. T. H. and J. E. N.), near Brizlingcote (G. B.), Bretby, common (T. G.), one pupa in Bretby Park (C. F. T.), Barrow (G. A. S.). *P. stabilis*, common throughout the district. *P. gracilis*, Burton, but rare (E. B.), Willington (W. G.), Branstone, osier-beds (C. F. T.), near Branstone (J. T. H.), Derby and Little Eaton (G. B.). *P. munda*, Henhurst (E. B. and C. F. T.), Repton (W. G. and C. F. T.). *P. pulverulenta (cruda)*, common throughout the district.

Orthosia upsilon, common in the larva state. *O. lota*, Henhurst (E. B. and W. G.), Burton, at sugar (C. F. T.), Drakelow (J. T. H.), Repton (G. B.), one at Bretby (T. G.).

Anchocelis rufina, Henhurst, common (E. B.). *A. pistacina*, common throughout the district. *A. lunosa*, Barrow (G. A. S.). *A. litura*, fairly common throughout the district. *A. vaccinii*, Henhurst, very common (E. B.), Willington (W. G.), Henhurst (C. F. T.), Bretby (T. G.), Derby (G. B.), Ashborne (H. F. G.). *A. spadicea*, Henhurst, common (E. B.), formerly at Burton (J. T. H.), Willington (W. G.), Derby (G. B.), Barrow (G. A. S.).

Scopelosoma satellitia, common throughout the district.

Xanthia citrigo, near Repton (W. G.), Bretby Park and Repton Shrubs (G. B.). *X. fulvago*, common throughout the district. Variety *flavescens*, occurs occasionally throughout the district. *X. flavago*, common throughout the district. *X. gilvago*, Burton and Derby (E. B. and W. G.), Derby, very common (G. B.), Barrow and Findern (G. A. S.). *X. circellaris* (*ferruginea*), common throughout the district.

Cirrhædia xerampelina, Repton, Willington, and Burton (E. B.), one near Willington (W. G.), larvæ common at Barrow (G. A. S.), larvæ at Burton and Willington (C. F. T.), common at Derby (G. B.), Dovedale (J. T. H.).

Tethea subtusa, Henhurst (E. B.), Barrow (G. A. S.), Bretby (T. G.), larva at Bretby (C. F. T.), common among poplars (G. B.).

Calymnia trapezina, common throughout the district. *C. diffinis*, Burton (E. B.), Etwall (W. G.). *C. affinis*, Burton (J. E. N.), Derby (G. B.), Barrow (G. A. S.), one at Bretby (T. G.).

Dianthæcia capsicola, Burton (E. B. and W. G.), Shobnall (J. E. N.), Barrow (G. A. S.), common in larva state (G. B.). *D. cucubali*, Burton (E. B., G. B., J. T. H.), common at Burton (C. F. T.). *D. carpophaga*, Shobnall (E. B.), Burton (C. F. T.), Bretby, common (G. B.).

Polia chi, Burton (E. B. and W. G.), Barrow (G. A. S.), Little Eaton, common (G. B.), near Ashborne (H. F. G.), Rugely (R. F.). *P. flavicincta*, once at Derby (G. B.).

Dasypolia templi, one at light at Derby (G. B.).

Cleoris viminalis, Henhurst (E. B., J. T. H., and G. B.).

Miselia oxyacanthæ, common throughout the district. Variety *capucina*, occurs occasionally throughout the district.

Agriopis aprilina, Burton (E. B.), Repton (W. G. and G. B.), Barrow (G. A. S.), Derby (G. B.), Henhurst (J. T. H.), Bardon Hill, common (C. F. T.), Rugeley (R. F.), Okeover, near Ashborne (H. F. G.), one in Bretby Park (T. G.).

Euplexia lucipara and *Phlogophora meticulosa*, common throughout the district.

Aplecta prasina, occurs occasionally throughout the district. *A. occulta*, once at Drakelow (G. B.), three at sugar at Bretby, 1881 (T. G.). *A. nebulosa*, common throughout the district.

Hadena adusta, Henhurst (E. B.), Willington (W. G.), Burton (G. B. and J. E. N.), larvæ at Cloud lime quarry (C. F. T.). *H. protea*, fairly common throughout the district. *H. glauca*, Cannock Chase (E. B. and C. F. T.). *H. dentina*, common throughout the district. *H. trifolii* (*chenopodii*), Stapenhill (J. T. H.), common (G. B.). *H. dissimilis* (*suasa*), Henhurst and Repton Shrubs (E. B. and W. G.), larvæ at Burton (C. F. T.), once at Derby (G. B.), Barrow (G. A. S.). *H. oleracea*, common

throughout the district. *H. pisi*, Bretby (T. G.), larvæ at Repton Rocks (T. G.), Ashby (G. A. S.), Little Eaton, common (G. B.). *H. thalassina*, common throughout the district. *H. contigua*, common in larva state on Cannock Chase (G. B.).

Xylocampa areola (*lithoriza*), on sallow blossoms (W. G.)

Calocampa vetusta, Henhurst (E. B.), Burton (C. F. T.), once at Bretby (T. G.). *C. exoleta*, Henhurst (E. B. and J. T. H.), Willington (W. G.), Barrow (G. A. S.), once at Bretby (T. G.).

Asteroscopus sphinx (*cassinea*), on lamps on Burton Bridge (E. B.).

Cucullia verbasci, Ticknall lime quarries (C. F. T.), larvæ at Derby (G. B.), Newton Solney (J. T. H.). *C. chamomilla* (?), larva at Willington (W. G.). *C. umbratica*, common (E. B. and W. G.), Burton (C. F. T.), Drakelow Park palings (J. T. H.), Bretby (T. G.), one at Barrow (G. A. S.), Derby (G. B.), Rugeley, common (R. F.).

Gonoptera libatrix, common throughout the district.

Habrostola tripartita (*urtica*), Burton (E. B. and W. G.), Barrow (G. A. S.), Derby (G. B.). *H. triplasia*, common throughout the district.

Plusia chrysitis, common throughout the district. *P. festuæ*, near Derby (W. G.), one at Barrow (G. A. S.), common near Trent Valley Station (R. F.). *P. iota*, common throughout the district. *P. pulchrina*, very common (E. B. and W. G.), Burton (C. F. T. and G. B.), Shobnall marl pit (J. E. N.), near Ashby (G. A. S.), Osmaston, near Derby (H. F. G.). *P. gamma*, common throughout the district. *P. interrogationis*, Cannock Chase (E. B.).

Anarta myrtilli, Cannock Chase (E. B. and J. T. H.), Breadsall Moors (G. B.)

Heliaca tenebrata (*arbuti*), common (E. B. and W. G.), Barrow (G. A. S.), Breadsall Moors (G. B.).

Heliothis dipsacea and *Chariclea umbra* (*marginata*), once at Breadsall Moors (G. B.).

Phytometra viridaria (*ænea*), Cannock Chase (E. B.), Bladon Hill (J. T. H.), Derby (G. B.).

Euclidia mi, The Lawns (E. B.), Dovedale (J. T. H.). Chartley (T. G.).

Catocala fraxini, occurred once in Burton (E. B.).

Zanclognatha grisealis, Henhurst (E. B. and W. G.), Repton Shrubs (G. F. T.), Bretby (T. G.). *Z. tarsipennalis*, Repton Shrubs (E. B. and J. E. N.).

Pechypogon barbalis, Grange Wood (E. B. and J. T. H.), near Ashby (C. F. T.).

Hypena proboscidalis, common throughout the district.

Brephos parthenias, seen flying round birches in Repton Shrubs, 1882 (T. G.).

(To be continued.)

SILK IN ASSAM.*

ASSAM AS A SOURCE OF SUPPLY TO THE ENGLISH MARKET.

Commercial worthlessness of the Wild Silkworms of Assam.—

Some misapprehension seems to prevail among English silk-spinners with regard to the nature of the silkworms which furnish the silks of Assam. I find the domesticated *muga* and *eri* included in Mr. Wardle's pamphlet on the wild silks of India; while in a lecture on silk-spinning, delivered in the Technical College, Glasgow, the tusser worm is alluded to as generally cultivated in this province. A similar misconception (so far as Assam is concerned) appears to pervade the Resolutions of the Government of India of the 23rd November, 1875, and of the 28th February, 1879, directing attention to undomesticated silk-spinning worms in general and to the tusser silkworm in particular, and asking for certain information regarding them. The information required will be found in the second part of this note; but in treating of the silks of Assam it is desirable to make clear at the outset that from the wild silkworms of Assam, as they now exist, nothing whatever is to be expected. They may possess a scientific interest, but they are certainly destitute of all commercial value, present or perspective. Their cocoons in the wild state are not to be found in numbers anything like sufficient to repay the cost of collecting, or to furnish the slightest hope that they will ever be able to supply the English market. It is exceedingly doubtful whether by the most strenuous efforts one hundredweight of wild cocoons of all sorts could be collected in the whole of the Assam Valley. The commonest of all is the variety of tusser, called *kutkuri* in Assam, and this is so rare that virtually one never hears of it. In times previous to the British rule this worm used to be cultivated to a small extent in the vicinity of Jorhát, but it has long fallen out of fashion; and in 1877 the Chief Commissioner of Assam was of opinion that to attempt to create a tusser silk industry in this province would be simply to court failure. More recently the failure of Major Coussmaker's operations in the Deccan has proved the futility of attempting to make anything out of tusser in Assam, where it is vastly less

* Extract from report of Mr. E. Stack, Director of Agriculture in Assam.

abundant. Such being the prospects of tusser, it is hardly necessary to speak of the other wild worms of Assam. Eight species are described, whereof three are the wild varieties of the *pát*, *muga*, and *eri* worms, and none of them are turned to any practical account, though cocoons found by chance in the jungle may occasionally be brought home by the cultivator, and reeled or spun together with cocoons of his own brood. In the wild state they occur but sparingly, their principal habitat being the dense and unpeopled jungle of the submontane tracts, while the possibility of domesticating them in Assam need not be considered for a moment. It is not to be expected that the Assamese, who take so little care and trouble with the domesticated worms they have already, could ever be induced to make experiments with a new species, nor is there any reason to believe that the produce of the wild worms, even if successfully cultivated, would prove in any way superior to the existing silks of the country.

The Domesticated Silkworms of Assam.—Dismissing the wild worms, therefore, from consideration altogether, we have three kinds of domesticated worms in Assam, or rather, it may be said, in the Brahmaputra Valley, for the Surmá Valley is not generally a country of silk cultivation. These are the *pát* or mulberry worm (*Bombyx textor*); the *muga* or sum-feeding worm (*Antheræa assama*), whose cocoon, like that of the *pát*, can be reeled; and the castor-oil worm (*Attacus ricini*), yielding a silk which is never reeled, but spun by hand. Looking simply to their commercial potentialities, these three species of silkworm may at once be reduced to two, by striking out the mulberry worm (*pát*), on account alike of the costliness of its silk, the scantiness of the present supply, and the difficulty of extending its cultivation. The two remaining species, the *muga* and *eri*, present a much more hopeful field of enterprise. They are produced in considerable quantity already; they are thoroughly adapted to the climatic conditions of Assam (being, indeed, probably indigenous to this part of India), and there is no obvious reason why their cultivation should not be capable of immense development. The *eri* is the more promising of the two, both because it is cheaper and more abundant, and also because, being reared entirely indoors, its cultivation does not entail that troublesome necessity of watching by night and day which

is imposed upon the *muga* breeder during the period that his worms are on the trees. The *muga*, indeed, yields the finer silk, but as it is only in the roughest shape that Assam silk can hope to become an article of demand in the English market, the difference in quality will, perhaps, prove to be a matter of secondary importance.

Form of Silk Trade possible between Assam and England.—There are two forms in which a silk trade is conceivable between Assam and England. We may export the thread, or we may export the cocoons. It may be said at once that the export of thread would never pay. *Muga* thread is now selling at about Rs. 8 and *eri* at about Rs. 5 the seer (6s. 8d. and 4s. 2d. the lb.); and, when it is remembered that the reeling is of the rudest character possible, that the thread is coarse and uneven, and that no two skeins as a rule will be found to correspond in quality, it will easily be understood why *muga* is incapable of competing with the finer and not more expensive silks of Bengal; and, indeed, in Bengal itself the silk reeling business has for some time been in a stationary or decaying condition. *Eri* thread is still more “uneven, gouty, and knibby,” and would probably be regarded by the English manufacturer as unfit for employment for any purpose. From the export of cocoons, on the other hand, there may possibly be something to hope. The manufacture of silk plushes and similar fabrics out of waste cocoons imported from India or China is a flourishing branch of the silk industry in England, and although China has hitherto been the principal source of supply there is no reason why Assam should not contribute large quantities of an article which is produced with so much ease in the valley of the Brahmaputra.

Now, in comparison with other parts of India, Assam seems to possess superior capabilities for supplying a demand of this nature. The conditions of tusser cultivation in Bengal, as described by the Commissioner of Chota Nagpur (Supplement to ‘Calcutta Gazette’ of 31st Oct., 1883) appear much less favourable than the conditions of *muga* cultivation in this Province. He calculates that a man can tend fifteen trees, yielding 450 cocoons in an ordinary year and 1500 in a bumper year such as occurs occasionally; and the selling price of the cocoons is 160 the rupee. The *muga* cultivator in Assam would obtain more than 3000 cocoons from an equal number of full-grown *sum-*

trees, and the price of the whole cocoons is about 600 the rupee. It follows that Assam ought to be in a much better position to supply cocoons to the English silk-spinner than the principal tusser producing districts of Bengal. If a similar calculation be made with regard to *eri* cocoons, the result appears still more favourable.

Previous attempts to develop Silk Cultivation.—No attempt seems ever to have been made to develop the cultivation of *muga* for the English market, but we have the record of Mr. C. H. Lepper's experiment with *eri* in the Lakhimpur district about 1872-73. Mr. Lepper was commissioned by Messrs. Lister & Co. to take up land and try the experiment of rearing the *eri* worm on a large scale, so as to thoroughly prove the practicability of procuring silk in sufficient quantity to make the business pay. His choice of a site in the southern portion of Lakhimpur was perhaps an unfortunate one, as the worm is much more widely cultivated on the confines of Kámrúp and Darrang. He found the climatic conditions exceptionally favourable, the supply of food abundant, and the worm so peculiarly adapted to breeding as to suggest the belief that with proper care a constant rotation of crops could be obtained, so that the operations of breeding and spinning might go on uninterruptedly all the year round. Some experiments made with the cocoons also pointed to the possibility of considerably improving them in size and quality. But the difficulty of procuring labour, and its costliness when procured (local labour being quite inefficient) were so great as to deter him from advising Messrs. Lister and Co. to continue operations. His own estimate was that the cost of suitable buildings on even a moderate scale, to replace the native style of house, which is not proof against damp, rats, or insects, would not be less than £3000. A similar attempt was made some six years ago by a European in the neighbourhood of Rangia, in Kámrúp, but he was compelled to abandon it after losing his entire crop by disease.

Experiments now being made.—In the face of these precedents, the prospects of *eri* cultivation on a large scale, either by the Government or by private enterprise, is not encouraging, and the difficulties are still greater in respect of *muga*. But the case is different with the native breeder, who

spends nothing and therefore can suffer no loss. Were a market once opened for *muga* and *eri* cocoons at fixed rates and in unlimited quantity, it is probable enough that the cultivators would be glad enough to bring their cocoons to it, and that, under the stimulus of a certain and regular demand, the supply would soon begin to increase. Only the waste cocoons—the perforated cocoons through which the moth has been allowed to eat its way—would be required, and the seller would not even be put to the trouble of boiling his cocoons as he does now before offering them for sale. The practicability of getting up a supply for the English silk-spinner in this way depends, of course, upon the price which he finds it worth his while to offer for the article supplied. In November, 1883, I despatched a small consignment of *eri* cocoons to a silk-spinner in England, who has sent me samples of the yarn prepared from them, and asked for a large supply. It is not safe to enter into any minute calculations in these matters, but it seems to me that a price of 1s. per pound for either *eri* or *muga* cocoons in London would repay the exporter. The great want at present is free communication between the exporter and the producer. The indolence and suspiciousness of the Assamese ryot have to be overcome, and this can be done far better by private enterprise than by Government agency, though the latter may be able to help private enterprise in pushing its way in Assam. As it is, the demand for waste silk in England has already begun to attract a trade in *eri* cocoons, and some 400 to 500 cwt. are exported annually from Goálpára to Calcutta for shipment to London, but this supply is very far from adequately representing the productive capabilities of the Assam Valley.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS DAPLIDICE.—My brother, writing from Folkestone, reports that a schoolboy has recently taken in the Warren there two specimens of this insect. He has seen one of them; it is in good condition, apparently fresh from the chrysalis.—BERNARD COOPER; 2, Pembury Road, Tottenham.

MELITÆA CINXIA.—The fastidious taste in the choice of localities of *M. cinxia* is well known. It has made this and the

adjacent isles favoured spots in the eyes of entomologists by its distinguished presence. But though many hundreds have passed under my eye and through my net, I never saw a specimen sufficiently differing from the type-form worthy of the name of a variety until now. To-day—half a mile inland, an unusual occurrence—I captured a specimen in good condition, but for a nick in one under wing, in which the black markings of the upper wings have coalesced so as to form a broad band. This band is a quarter of an inch wide on the costal margin, growing gradually smaller, but equally clear as it approaches the inner margin. In the centre of the band, but towards the costa, the band opens and shows a spot of the usual ground colour. Am I right in supposing that such varieties are (as according to my experience) uncommon in this species?—(Rev.) FRANK E. LOWE; St. Stephen's, Guernsey, July 1.

CHÆROCAMPA NERII AT HARTLEPOOL.—A specimen of *Chærocampa nerii* was taken by myself yesterday morning on the railings surrounding a timber yard. It is in fairly good condition, though evidently a hybernated specimen, the colours being somewhat faded. I believe this will be the first record of its occurrence so far north. Mr. J. G. Robson saw it alive.—J. GARDNER; 8, Friar Terrace, Hartlepool, July 24, 1885.

ACRONYCTA ALNI AT SUGAR.—I was pleased to take a specimen of the above insect, on an oak tree, at sugar, near Lyndhurst, on 14th of June.—PERCY RENDALL; London, 1885.

GRAPHOLITHA CÆCANA AT DEAL. — While collecting during the present month on the south-east coast of Kent, in the neighbourhood of Deal in company with two friends, we were fortunate in securing a nice series each of *Grapholitha cæcana*. I also captured a lovely series each of *Argyrolepia mussehlana*, *Scoparia pallida*, *Acidalia ochrata*, *Pterophorus lienigianus*, and *Chauliodus illigirella*. Insects generally were abundant. *Lithosia lutarella* v. *pygmæola* was already well out, and *Conchylis alternana* just appearing. Many species on the cliffs were, however, much worn, owing I suppose to the windy weather prevalent during the early part of this month, and the latter part of last.—J. W. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E., July, 1885.

DISCOVERY OF THE LARVA OF GRAPHOLITHA CÆCANA, *Schl.*—In July, 1884, from observing the habits of this insect, I felt sure

that *Onobrychis sativa* was its food-plant. In August, upon cutting open some of the previous year's stems, I obtained undoubted traces of its work, some of the stems being filled with decaying frass. Successive visits to the locality were paid in September, October, and November, and not till then was I rewarded by the discovery of the larva in the stems near the roots of *Onobrychis sativa*. Seven larvæ were found, which had then apparently ceased to feed, and from them the following description is drawn up:—Length 5 lines, somewhat tapering, the 2nd and 3rd segments being broader than any of the others, the 3rd being the broadest. Colour bright yellow; head pale yellowish brown; face with two dark brown lines, which, with the dark brown mouth for base, form a triangle. 1st segment with two indistinctly defined pale yellowish brown plates, anal segment pale brown, dorsal vessel indistinctly pale brown. Spiracles small, pale brown; legs yellow, prolegs very short, yellow on the 6th, 7th, 8th and 9th segments. On the head and following segment are a few transparent hairs. The larva is active in its movements, progressing very readily backwards. It should be remembered that these larvæ may have been full-fed for some time before November, and perhaps have undergone a change in colour. On April 3rd, 1885, a dark brown patch had developed on the anal segment, the larva after its hybernation being somewhat thinner. On June 12th it had changed to a bright yellow pupa within the cocoon which I cut open. On June 25th, first the wing-cases and then the whole pupa changed to a rich dark brown. The imago (female) emerged on July 1st. The egg is probably laid singly and upon the stems of the plant about the middle of July. The larva commences to feed about three parts up the stem and works downward to the root, filling the stem above with pale brown frass. Its presence may be ascertained with certainty by slicing open the stems about half-way up, when the frass will betray it to the collector. Two of the larvæ which I cut out closed one end of the stem completely with silk, making at the other a gallery with a small hole for exit. The position of this species in our lists is unsatisfactory, and I am repeatedly asked to say something thereon. Mr. South puts it at the end of *Grapholitha*, which seems about as bad a place as one could find for it. To enter at any length upon a discussion of this point would involve the

whole question of the classification of the Tortricidæ, and this is ground upon which I almost fear to tread. They are certainly in a most unsatisfactory condition, but any partial revision based upon British species alone seems hardly worth doing, and surely the North American species would have to be considered, and if so, where shall we draw the line? And for a sound classification of the Tortricidæ of the world we must await more ample materials. I can but say that the species seems to be somewhat closely related to the genus *Bactra*, Es.; the habits of the larva also support this view. It is also a close ally of *Catoptria hypericana*.—G. COVERDALE; 24, Fleming Road, Lorrimore Square.

DRYINUS FORMICARIUS, Latr., AT SHIERE.—On June 15th, while beating a maple bush to obtain the little Homopteron, *Rhinocola aceris*, I took a fine example of this curious insect, remarkable not only for its singular structure, but also for its great rarity, for I believe there is only a single record of its capture before in England, and it appears to be equally uncommon in other countries. It is strange that as yet the male is quite unknown, and in fact the economy of the creature is also entirely a guess, as nothing has ever been discovered of its habits, or upon what insect it is parasitic, as no doubt it has a host of some kind. In the 19th vol. of the Ent. Mo. Mag. Mr. Douglas has given some notes concerning the parasitism of its near ally, *Gonatopus*, on certain species of Homoptera; and I think it extremely probable that we may look in that Order for its prey. It must, however, be a large insect to nourish another of such size, my specimen being quite 3 lines in length. The only large Homopteron that I could find in the same bush was *Cixius contaminatus*, and this was in abundance; and I think it not at all unlikely that it was the insect from which the *Dryinus* receives its supply of food.—E. CAPRON; Shiere, July 1, 1885.

A PEST OF FLIES.—Since Monday Oxford has been visited by a plague of flies, which renders walking in the streets extremely uncomfortable. As far as I can observe, the swarm is chiefly composed of two varieties of the winged aphis, one being bright green in body, and the other a lighter yellowish green with black-brown mottled patches. There are also innumerable beetles, apparently a tiny species of rove beetle, which have a habit of getting into the nostrils of the passers-by, and, if crushed, emitting an insufferable odour.—G. E. SIMS, jun.; Oxford.

REVIEW.

Report of Observations of Injurious Insects and Common Farm Pests during the year 1884, with Methods of Prevention and Remedy. Eighth Report. By ELEANOR A. ORMEROD, F.R.Met.Soc., Hon. Consulting Entomologist to the Royal Agricultural Society, &c. Simpkin, Marshall & Co. Royal 8vo, 122 pp.

WE are glad to receive another of these valuable Reports, showing the good work that is being organised by Miss Ormerod throughout the country. In the Preface it is stated that "The attention bestowed on the very important subject of insect prevention is showing year by year that the national losses are not by thousands, but by millions, of pounds. The loss in the hop failure of 1882 was estimated at a million and three-quarters, that from turnip-fly of 1881 at over half a million pounds sterling."

The subjects especially dealt with this year are Birds and the depredations of sparrows, Hop-aphis, and Warble-fly. In writing of the birds the reporter is very careful to state that "nobody wishes to destroy the small birds broadcast. We should suffer severely if their presence *generally* was lessened. . . . But with regard to the one item of sparrows, its special habits make this bird an exception to what we may fairly call our regular feathered *friends*." This is demonstrated by evidence from many careful and competent observers; amongst others Mr. A. Molineux, member of the Committee of Agriculture of the Royal Agricultural Society of South Australia, writes:—

"The sparrows here have driven off nearly all our insectivorous birds, which of course are small, and have generally soft bills and a timid nature; but the sparrow will eat nothing but seeds, while seeds are available. When there are no seeds they will eat fruit,—when there are no seeds or fruit they will condescend to kitchen vegetables (or zonal pelargoniums); but if none of the foregoing are to be had, and the dog, the pig, and the cows cannot be robbed, the sparrow will stay his hunger with Aphides or soft grubs and caterpillars."

The plague of *Charæas graminis* larvæ in South Wales is described and illustrated by a map of the district, some ten miles in diameter, where the ravage was great.

Much careful observation and experiment has been devoted to the hop aphid, and Miss Ormerod thinks there is good reason for believing the course of attack to be as follows:—

“1st. That the first attack of Aphid to the hop begins in spring from wingless females (depositing living young), which come up from the hop-hills. 2nd. That the great attack, which usually occurs in the form of ‘fly’ about the end of May, comes on the wing from damson and sloe, as well as from hop, and that the hop aphid and the damson hop aphid are very slight varieties of one species, and so similar in habits as regards injury to hop that for all practical purposes they may be considered one. By hop and damson hop aphid I mean the *Aphis* (*Phorodon*) *humuli*, Schrank, and the *Aphis* (*Phorodon*) *humuli*, var. *Malaheb*, Fonsc.; but in no case the *Aphis* *Pruni*, Réaum., or any other kind.

“Further, it has been shown by the result of various experiments on the hop-ground at Stoke Edith Park, Hereford (allowed us by the kind courtesy of the Lady Emily Foley) that the use of various applications round the hills in the late autumn, or about the beginning of April in spring, completely prevents attack to the vines of those hills until the summer attack came on the wing.”

Miss Ormerod differentiates between the two species and gives figures, which we are kindly permitted to reproduce.

“Now, looking at the history of the hop aphid and of the damson hop aphid side by side, we find them starting at the same time in spring respectively on their several plants, continuing similarly to increase; and similarly, about the end of May, to gain the winged state; and up to this date, by constant microscopic examination, I did not find any difference in the frontal development of the young lice of the kinds under consideration when first produced, nor in that of the winged females. The accompanying figures, [Fig. I.] drawn from life, show the similarity.”

* * * * *

“From the latter part of March onward to about the time of the appearance of the fly, I found that the hop-lice had the frontal tubercles and enlarged root-joint, as in fig. I., this sketch being a representation of large numbers sent me from infested hop-plants, and I could detect no difference in form between the lice from hop-plants and those from sloe or damson. At the time of flight from the sloes I figured the wingless females and pupæ (or larvæ containing young) from hop-plants, and also from damson or sloe, and noticed a slightly greater amount of gibbousness in the root-joint of the antennæ of the hop aphid, but, as shown in Fig. II., this difference is very slight. But, continuing the observations after a time, I found a difference in amount of development of these frontals in some of

these young hop-lice, and, on being furnished with a supply in hop-cones, on the 26th August, I found that the frontal tubercles and amount of gibbous form of the root-joint of the horns was more developed; in fact, now (that is, in the summer form) they precisely resembled the typical figure of the head of the *humuli* larva given by Mr. Buckton (Fig. III., 1), which I copy for comparison with my own drawing (Fig. III., 2, from a summer specimen)."



Fig. I.—LARVÆ. WINGED FEMALES.
1, 2, Hop Aphis; 3, 4, Damson Hop Aphis.

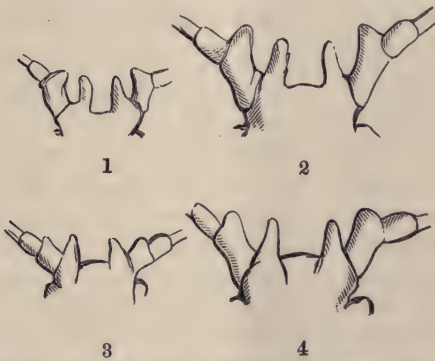


Fig. II.—ADVANCED STAGE (? PUPÆ). WINGLESS FEMALES.
1, 2, Hop Aphis; 3, 4, Damson Hop Aphis.



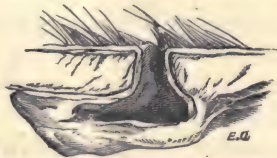
Fig. III.—LARVÆ OF HOP APHIS.

Evidence is then adduced from entomologists of repute in favour of the theory of the hop aphis migrating from the sloe. The opinion held by a large number of hop-growers that the fly

comes to some extent on the wing from sloe or damson is considered a strong confirmation of this theory.

Miss Ormerod's great work of the year, however, has been the discovery of mercurial ointment as a simple and inexpensive means of destruction of the warble-fly in cattle.

"The great injury which is caused year after year by this attack is not only from the perforations of the maggots lessening the value of the hides, but from the loss in flesh and milk and health in summer, when the animals are started by their terror of the fly to gallop as fast as they can go; and later on the suffering and drag on the system of supporting may be six, ten, or twenty, sometimes even more than a hundred, of these strong maggots growing up to an inch in length and feeding in the sore, which they keep up from January or February until they are full-grown."



Section of Warble, slightly larger than life.

It is estimated that the annual losses from warble-fly (above is a figure showing section of a warble in the hide) amount to the enormous sum of from *seven to eight million pounds sterling*, and Miss Ormerod shows how the attack may be very greatly lessened, safely, cheaply, and without injury to the hide.

"It should be observed relatively to destroying the maggot that it breathes, or rather draws in the air necessary for it, through the two somewhat kidney-shaped black spots, which are easily seen in the tip of the tail-end of the maggot in an advanced warble. If these 'spiracles' or breathing-pores are choked the insect dies; consequently, if anything like tar or mercurial ointment, or other choking substance, is applied, the maggot is sure to be destroyed. Piercing the warble is not so perfectly certain to kill it, as the operation is not always thoroughly performed. Of the various applications noticed that of mercurial ointment appears the simplest and surest."

The smallest quantity of mercurial ointment (as much as a small pea) placed on the hole in the skin carries death within twenty-four hours.

We strongly recommend our readers to procure this Report, for it is of equal interest to entomologists and to farmers, while as a record of patient and unwearying work it cannot fail to win the admiration of all.

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[No. 268.

COLEOPHORA TINCTORIELLA, MIHI.

BY GEORGE COVERDALE, F.E.S.

Exp. $8\frac{1}{2}$ lines. Head white, pale grayish ochreous in the centre; face pure white; palpi above, within and beneath white, without pale gray; 3rd joint pointed, more than half as long as the 2nd, from which it rises upwards at a considerable angle. 2nd joint with a white projecting tuft beneath. Antennæ white, annulated with fuscous, sometimes wholly white towards the extremity; basal joint whitish, with a short pale gray tuft beneath. Thorax white, more or less pale ochreous down the centre; patagiæ white, pale ochreous towards the tips. Abdomen gray, dusted with whitish scales above and beneath. Legs white. Anterior wings rather broad, dark brownish ochreous in the costal region, ochreous towards the inner margin, but varying considerably in intensity of colouring, some specimens being nearly as dark as *Coleophora saturatella*, others almost entirely ochreous. A pure white streak runs along the costa, slightly broader beyond the middle, reaching nearly to the apex, where it becomes attenuated and loses its purity of colour. Along the fold is a narrow pure white line, not reaching the margin. *The base of the wing between the fold and the inner margin is white, more or less mixed with ochreous*, the former colour being continued as a narrow line along the inner margin to the anal angle. Nearly in the middle of the disk above the fold is a short, slender, pure white line, sometimes interrupted. Apical fringes brownish ochreous, grayish fuscous towards the inner margin. Hind wings gray, with long grayish fuscous fringes.

The following is a description of the larva, which feeds in a pale yellowish brown case upon the leaves of *Genista tinctoria* in May and June:—Length, 3 lines. First three or four segments pale greenish, the remaining (those which are not extruded from the case, and consequently unexposed to the light) of a dirty yellow colour. Head dark brown; 2nd segment with a large black transverse oval plate, divided down the centre by a thin longitudinal pale greenish line; 3rd segment with a similar but much smaller plate; anal segment with a black plate; 2nd, 3rd, and 4th segments with small black spiracles. The dark pulsating dorsal vessel is conspicuous. The segments enclosed within the case are stouter than the first four segments. The larva lives in a pale brown case formed of about six leaflets of *Genista tinctoria*, and is constructed much in the same way as that of *Coleophora saturatella*; but is generally larger, looser, more straggling, and less compact in appearance. It is to be found in May and June making somewhat inconspicuous blotches in the leaves of *Genista tinctoria*, the imagines appearing towards the end of June and later. The earliest emergence I obtained was on the 24th of that month.

The only British species with which this could be confounded is *C. saturatella*, Stn., to which it is very closely allied. But *tinctoriella* may always be distinguished by its bright and more ochreous appearance, and by the presence in greater or less quantity of pale ochreous scales at the base of the wing on the inner margin and on various parts of the thorax above. A microscopic examination of many specimens shows *saturatella* to be destitute of this pale ochreous pigment on any part of the body or wings, which thus becomes a good distinguishing character between the two species. I am unable to find any marked difference between the larvæ of these two insects, which were bred side by side under similar conditions. The dark brown case of *saturatella* from broom is easily distinguished from the almost ochreous one of *tinctoriella*, the difference being of course due to the different colours assumed by the leaves of their respective food-plants in withering, the broom turning almost black. *C. saturatella* appears to be a somewhat later insect than *C. tinctoriella*, for the broom was quite leafless this spring at a time when *tinctoriella* was almost full-fed. *C. tinctoriella* also was the first to emerge. Mr. A. C. Vine, of Brighton (to whom we

are indebted for this addition to the genus), tells me that in the locality in which he finds *tinctoriella* he has searched well, but unsuccessfully, for *saturatella*, although the broom grows there in abundance. He also tried to feed his *tinctoriella* upon broom, but they would not touch it.

When last year Mr. Vine sent me *tinctoriella* to name as doubtfully *saturatella*, I replied that I believed it to be identical with the continental *bilineatella*, Zell., which also feeds upon *Genista tinctoria*, but upon looking further into the subject this conjecture became more and more improbable. Now *bilineatella*, Zell., seems shrouded in mystery. Zeller says ('Linnæa Entomologica,' Bd. iv., 272)—"The discoidal line is entirely absent." *C. tinctoriella* shows this line clearly, which, had Zeller's description of *bilineatella* been accurate, would have sufficed to separate the two species. But specimens of *bilineatella*, Zell., in the British Museum and others I have seen in Mr. Stainton's collection show this line, the existence of which Zeller denies. Herrich-Schäffer ('Systematisches Bearbeitung,' v., No. 686, p. 239, fig. 690) figures *bilineatella* with a discoidal line. Furthermore, upon Zeller's (Lord Walsingham's) own specimens this discoidal line is to be traced, which is therefore of no use as a distinguishing character for *bilineatella*, Zell. Again, under this name two very different insects are met with. In Mr. Stainton's collection, bred from continental larvæ in England, is a series of *bilineatella*, some of the specimens being very dark brown, like *saturatella*, and others bright ochreous, like the ordinary continental type of the species. The cases from which the insects were bred are also of two kinds, the one dark brown, as in *saturatella*, the other pale brown, as in *tinctoriella*. Heinemann says (and it is generally known) that this so-called *bilineatella*, Zell., feeds upon broom as well as *Genista tinctoria*, and it at once occurred to me that in all probability there were two distinct species, one from broom, the other from *Genista tinctoria*, united under the name of *bilineatella*; and it seemed highly probable that the ochreous insects came from the pale *Genista* cases, whilst the dark broom cases produced the darker insect. Accordingly I wrote to my friend, Herr August Hoffmann, of Hanover, for assistance, which he most readily afforded. In his own collection were two brown specimens bred from *Sarothamnus scoparius*, with dark brown cases. He next examined the cabinet of Herr Glitz, in which

were eight specimens; four of them bred by himself (Glitz) from broom were dark brown, with dark cases; the other four (two of them with Zeller's own labels) were pale ochreous, being bred from ochreous *Genista tinctoria* cases. Heinemann's collection was next inspected, with the following result:—Three insects with dark brown cases from broom, under the name *spartiella*, Hein., with Heinemann's own labels, "*Spartium scoparium* = *Sarothamnus scoparius*"; seven ochreous specimens, under the name *bilineatella*, Zell., with a pale case from *Genista tinctoria*. It seems pretty clear, then, that Heinemann intended to separate the two forms as distinct species, that from *Genista tinctoria* as *bilineatella*, Zell., the other from broom as *spartiella*, Hein.; but Wocke, who finished Heinemann's work, has united them under the name *bilineatella*, Zell. Dr. Rössler, in 'Die Schuppenflügler,' &c., says that the clear yellow cases found on *Genista* are larger than the dark ones from *Sarothamnus*.

It was my intention, before saying anything on this subject, to rear all the four forms together for comparison, but all my efforts to obtain living larvæ from the Continent have been unavailing; and as it is very improbable that an opportunity will again present itself, it seems best to publish the evidence already collected. Enough has been said, I think, to show the distinctness of *tinctoriella* from *saturatella*; neither can it be confounded with the form *spartiella*, nor with *bilineatella*. It seems, therefore, that we have four species in this group, viz.:—

C. bilineatella, Zell.—Imago ochreous. Case ochreous. *Genista tinctoria*.

C. tinctoriella, Cov.—Imago brown. Case ochreous. *Genista tinctoria*.

C. saturatella, Stn.—Imago brown. Case dark brown. *Sarothamnus scoparius*.

C. spartiella, Hein.—Imago brown. Case dark brown. *Sarothamnus scoparius*.

The two species which feed on *Genista tinctoria* are most readily separated from each other; but between *spartiella*, Hein., and *saturatella*, Stn., there seems to be little distinction, and further investigation may induce us to sink *spartiella*, Hein., as synonymous with *saturatella*, Stn. *C. tinctoriella* holds an intermediate position between *bilineatella*, Zell., and the (two?) broom-feeding species. It may perhaps be regarded as the British representative of *bilineatella*, its more sombre colouring

being in consonance with the general action of our climate in toning down bright colours. To Mr. Vine belongs the honour of this discovery, and in conclusion I can but acknowledge his kindness in furnishing me last year with specimens and this year with larvæ. My best thanks are due also to Mr. Machin for his assistance with *saturatella*; also to Mr. Stainton, Herr Aug. Hoffmann, and others.

24, Fleming Road, Lorrimore Square, S.E., August 8, 1885.

LEPIDOPTERA IN ARGYLLSHIRE.

BY HOWARD VAUGHAN, F.E.S.

IN last June I spent a few weeks near Kilmartin, Western Argyllshire. I was unable to devote as much time as I could have wished to exploring the Lepidoptera of the district, and my operations were to some extent impeded by unfavourable weather. The season was also a late one, and many species known to occur were not to be found.

Having been furnished by Mr. C. A. Briggs with a locality in the hills of North Knapdale for *Melitea aurina* (*artemis*), I went there several times. Though unsuccessful on my first journey, on subsequent occasions I met with the species, but always sparingly. The specimens obtained were very brightly coloured; some resembled the variety *hibernica* taken by Mrs. Battersby, and there were also some nice aberrations, or, as we used to call them, varieties.

In this same elevated locality *Pieris napi*, *Cænonympha pamphilus*, and *Thecla rubi* were not uncommon, and one *Lycæna icarus*, a very ordinary one, made its appearance. *Lasiocampa rubi*, very dark and well-marked, differing much from southern specimens, was common, but difficult to capture. *L. quercus* larvæ, which will doubtless develop the variety *callunæ* of Palmer, occurred. *Spilosoma fuliginosa*, the usual dark Scotch form, completes the list of Bombyces.

Anarta myrtilli, *Euclidia mi*, and *Phytometra viridaria* (*ænea*), all fairly common, represented the Noctuæ. The Geometræ were *Eupithecia satyrata*, common, but difficult to obtain in fine condition. The specimens were less spotted than some I have from Edinburgh, which I believe Mr. Stainton has named

callunaria. *Fidonia atomaria* was abundant and somewhat variable. *Acidalia fumata* was only beginning to put in an appearance.

The Pyrales were *Pyrausta purpuralis* and *Botys fuscalis*, and the only *Crambus* was *C. pratellus*,—all common. Tortrices were by no means plentiful, and I only observed *Penthina dimidiana*, *Bactra lanceolana*, *Ephippiphora pflugiana*, *Phoxopteryx uncana*, *Cnephasia musculana*, *Phlæodes tetraquetana* (brightly marked), *Eupæcilia ciliella* (large), and *Argyrolepis hartmanniana* (*baumanniana*). Near my headquarters *Pieris brassicæ*, *P. napi*, *Argynnis selene*, *Cænonympha pamphilus*, and *Lycæna icarus* were the only butterflies to be found. I captured also the following:—*Nudaria mundana* larvæ, commonly on lichen-covered walls (the imago has since appeared, and are somewhat darker than their southern relatives); *Euchelia jacobææ*, common; *Hepialus humuli*, abundant, but exhibiting no variation; *H. velleda*, rare; *Thyatira batis*, one; *Odontoptera bidentata*, rather dark; *Amphidasys betularia*, typical; *Melanippe montanata*, abundant and smaller than the southern English specimens, and one is as dark as the Shetland examples; *M. fluctuata*, also dark; *Hypsipetes trifasciata* (*impluviata*), in an alder swamp; *Eupithecia satyrata*, on a moss; *E. castigata*, the usual type; *E. vulgata*, strongly marked, and reminding me of some sent to me from Renfrewshire by Mr. Dunsmore; *Scoparia ambigualis*, rather darker than usual, was not uncommon in some places.

I should mention that some female *P. napi* captured on a moss are much darker than usual, resembling some from Arran in Mr. Briggs's collection. Although the species was abundant throughout the district, I was unable to find this dark form in any other place. I was especially anxious to have obtained a long series of *L. icarus*, but was evidently too early. The solitary female I secured was very "ordinary," with very little blue. Most of the males, however, were darker in the tint of blue than our southerners, and some have a distinct black margin to the wings.

During my stay I had an opportunity of visiting one of the smallest islands in the Sound of Jura. There I found insects were uncommon, but captured *Scoparia ambigualis*, another *Scoparia*, which may be a dark form of *dubitalis*, *Penthina dimidiana*, *Phoxopteryx lundana*, and *Blabophanes rusticella*.

The foregoing list does not contain the names of any rarities, but I think it is advisable to place on record anything which may contribute to our knowledge of little-worked localities, and the acquisition of interesting local forms is always desirable.

55, Lincoln's Inn Fields, London, August 17, 1885.

THE LEPIDOPTERA OF BURTON-ON-TRENT AND NEIGHBOURHOOD.

(Continued from p. 212.)

GEOMETRÆ.

Uropteryx sambucaria, common throughout the district.

Epione apiciaria, Henhurst and Burton (E. B.), osier beds at Repton (W. G.), Winhill Lane (G. B.), once at Bretby (T. G.), once at Barrow (G. A. S.), Osmaston Lane, near Derby (H. F. G.), Little Eaton (G. B.).
E. advenaria, Willington (E. B.).

Rumia luteolata (cratægata), common throughout the district.

Venilia maculata, Dovedale (E. B.), Dyden Wood, near Ashborne (H. F. G.), Charnwood Forest (J. T. H.).

Metrocampa margaritaria, Burton, &c. (E. B.), Repton (W. G.), Repton Shrubs (G. B.), Bretby and Tatenhill (T. G.), near Ashby (C. F. T.), common near Cauldwell (J. T. H.), Seal Wood, common (J. E. N.).

Ellopija prosapiaria (fasciaria), Breadsall Moors (G. B.).

Eurymene dolabraria, Henhurst, &c. (E. B.), near Repton (W. G.), Repton Shrubs (G. B. and C. F. T.), Derby (G. B.), once at Barrow (G. A. S.), near Ashborne (H. F. G.).

Pericallia syringaria, Rolleston (E. B.), scarce (W. G.), Burton (C. F. T.), Derby (G. B.), Barrow (G. A. S.).

Selenia bilunaria, common throughout the district. *S. lunaria*, Henhurst (E. B.), one at Repton Shrubs (W. G.), Derby (G. B.). *S. tetralunaria (illustraria)*, once at Osmaston, near Derby (H. F. G.).

Odontopera bidentata and *Crocallis elinguaris*, common throughout the district.

Eugonia alniaria (tiliaria), Burton, not rare (E. B. and W. G.), Burton, at light (J. T. H., &c.), Ashborne (H. F. G.), common (G. B.). *E. fuscantaria*, Burton (E. B.), one near Eggington (W. G.), Eggington and Derby (G. B.), Barrow (G. A. S.). *E. erosaria*, Burton, but rare (E. B.), larva at Repton Shrubs (G. B.). *E. quercinaria (angularia)*, Burton, common (E. B. and W. G.), Forest banks, Needwood (J. T. H.),

Repton Shrubs, common (G. B.), Brethby Park (J. E. N. and T. G.), Ashby (G. A. S.), Bardon Hill, abundant (C. F. T.).

Himera pennaria, Henhurst (E. B. and W. G.), Repton Shrubs, common (C. F. T.), Barrow (G. A. S.).

Phigalia pedaria (*pilosaria*), common throughout the district.

Nyssia hispidaria, Repton Shrubs (E. B.), larvæ in Repton Shrubs (G. B.), one female in Repton Shrubs (J. E. N.).

Biston hirtaria, Rugeley (R. F.).

Amphidasys strataria (*prodromaria*), Burton and Repton Shrubs (E. B.), one at Findern (W. G.), Repton Shrubs (G. B.), Newton Road (J. T. H.), one in Drakelow Park (G. H. W.), Cannock Chase (C. F. T.). *A. betularia*, common throughout the district. Variety *doubledayaria*, occurs throughout the district.

Hemerophila abruptaria, Burton (E. B., C. F. T., &c.), Willington (W. G.), Osmaston, near Derby (H. F. G.).

Cleora lichenaria, Henhurst (E. B. and W. G.).

Boarmia repandata, Burton, common (E. B.), Repton Shrubs (W. G., G. B., &c.), Seal Wood (J. T. H. and J. E. N.), Decoy plantation, Brethby (T. G.), Barrow (G. A. S.). *B. gemmaria* (*rhomboidaria*), common throughout the district.

Tephrosia crepuscularia, Barrow (G. A. S.), Cannock Chase (C. F. T.). *T. biundularia*, common throughout the district. *T. punctularia*, near Repton (W. G.), Repton Shrubs (G. B.), Little Eaton (G. B.), Cannock Chase (C. F. T.).

Pseudoterpna pruinata (*cytisaria*), once at Willington (W. G.).

Geometra papilionaria, Burton, &c. (E. B.), Burton (G. H. W.), Repton and Willington (W. G.), Repton Shrubs and Derby (G. B.), Caldwell (J. T. H.), once near Barrow (G. A. S.).

Phorodesma pustulata (*bajularia*), once at Shobnall marl pit (J. T. H.).

Iodis lactearia, common throughout the district.

Hemithea strigata, Henhurst (E. B.), formerly near Burton (J. T. H.), near Ashborne (H. F. G.).

Zonosoma punctaria, Repton Shrubs (C. F. T., &c.), near Ashborne (H. F. G.).

Asthena luteata, Derby (G. B.), Repton Shrubs (C. F. T.). *A. candida*, Henhurst (E. B., J. T. H., and J. E. N.), Repton Shrubs (C. F. T.), Seal Wood (G. B.). *A. sylvata*, Henhurst (E. B.), once near Repton (W. G.), once in Repton Shrubs (G. B.), Cannock Chase (C. F. T.). *A. blomeri*, Shobnall (E. B.), once near Repton (W. G.), wood near Hoar Cross (J. E. N.), Swilcar Wood, Needwood Forest (W. M. A.), common some years in Hoofies Wood, near Hartshorne (T. G.).

Eupisteria obliterata (*heparata*), Repton and Seal Woods (E. B.), Repton Shrubs (W. G., C. F. T., &c.), Repton rocks (T. G.), Barrow (G. A. S.).

Acidalia dimidiata (*scutulata*), common (E. B. and W. G.), Bretby (T. G.), Barrow (G. A. S.), Derby (G. B.). *A. bisetata*, common (E. B.), Shobnall (J. T. H. and G. B.), Bretby (T. G.), Barrow (G. A. S.), Breadsall Moors (G. B.). *A. virgularia*, common (E. B.), beaten out of ivy (W. G.), Burton, common (C. F. T.), Barrow (G. A. S.), once at Breadsall Moors (G. B.). *A. subsericeata*, Dovedale (G. B.). *A. remutaria*, Shobnall, &c. (E. B.), Henhurst (W. G.), Repton Shrubs (W. G., G. B., &c.). *A. fumata*, Dovedale (G. B.), Chartley (T. G.). *A. imitaria*, Burton (E. B. and W. G.), Barrow (G. A. S.), once at Derby (G. B.). *A. aversata*, common throughout the district. *A. emarginata*, Burton (E. B. and W. G.), Barrow (G. A. S.).

Timandra amatoria, Henhurst, &c. (E. B. and W. G.), Tatenhill (J. E. N. and T. G.), near Ashby (C. F. T.), Barrow (G. A. S.), Osmaston, near Derby (H. F. G.), Rugeley, common (R. F.).

Cabera pusaria and *C. exanthemaria*, common throughout the district.

Bapta temerata, Henhurst (E. B.), scarce (W. G.), Shobnall Road (J. T. H.).

Macaria liturata, Seal Wood (J. E. N.), Breadsall Moors (G. B.).

Halia vauaria (*wavaria*), common throughout the district.

Strenia clathrata (?), Cannock Chase, common (R. F.).

Panagra petrararia, Willington (W. G.), Parson's Brake (C. F. T., &c.) Cannock Chase (C. F. T.), Bretby Park (T. G. and J. E. N.), Repton Shrubs (W. G., G. B., &c.), Breadsall Moors (G. B.).

Numeria pulveraria, Henhurst (E. B.), once near Bretby (T. G.), Breadsall Moors (G. B.).

Scodiona belgiaria, Cannock Chase (T. G.).

Ematurga atomaria, Cannock Chase (E. B., C. F. T., &c.), once in Bretby Park (T. G.), Chartley Moss, abundant (J. T. H.), Breadsall Moors (H. F. G.).

Bupalus piniaria, Seal Wood (E. B.), one at Willington (W. G.), Cannock Chase (C. F. T.), Breadsall Moors, common (G. B. and J. E. N.), Variety *flavescens* (*piniaria*), Breadsall Moors (G. B. and J. E. N.).

Aspilates strigillaria, Cannock Chase (E. B.), Chartley (T. G.).

Abraxas grossulariata and *A. sylvata*, common throughout the district.

Ligdia adustata, near Ashby (G. A. S.).

Lomaspilis marginata, *Hybernia rupicaprararia*, and *H. leucopheararia*, common throughout the district. *H. aurantiaria*, abundant in Repton Shrubs. *H. marginaria* and *H. defoliaria*, common throughout the district.

Anisopteryx æscularia, generally distributed throughout the district.

Cheimatobia brumata, common throughout the district. *C. boreata*, fairly common in Repton Shrubs.

Oporabia dilutata, common throughout the district.

Larentia didymata, common throughout the district. *L. multistrigaria*, Breadsall Moors (G. B.). *L. casiata*, Dovedale, common (H. F. G.). *L. viridaria* (*pectinitaria*), generally distributed throughout the district.

Emmelesia affinitata, common throughout the district. *E. alchemillata*, Seal and Grange Woods (E. B.), Burton (C. F. T.), Bretby (J. E. N.), Barrow (G. A. S.). *E. albulata*, Barrow (G. A. S.), Anslow (C. F. T.), Seal Wood (J. T. H.), Repton Rocks (T. G.). *E. decolorata*, common throughout the district. *E. taniata*, Dovedale (F. M. Spilsbury).

Eupithecia venosata, Shobnall (E. B.), Shobnall marl-pit (J. T. H.), Repton and Little Eaton (G. B.). *E. linariata*, Barrow (G. A. S.), railway banks at Willington (G. B.), Breadsall Moors (G. B.). *E. pulchellata*, Shobnall (E. B.), Repton Shrubs and Derby (G. B.), Barrow (G. A. S.), Cannock Chase (T. G.). *E. oblongata* (*centaureata*), Burton (C. F. T.), Repton Shrubs and Derby (G. B.), near Ashby (G. A. S.). *E. subfulvata*, Winshill (G. B.), Barrow (G. A. S.), common on railway banks near Little Eaton (G. B.). *E. plumbeolata*, Little Eaton, common (G. B.). *E. isogrammaria*, one at Burton (G. B.), Derby and Breadsall (G. B.). *E. castigata*, Burton (E. B. and W. G.), Repton Shrubs and Hoofies Wood (G. B.), Barrow (G. A. S.), Cloud Wood (C. F. T.). *E. trisignaria*, Repton Shrubs, common (G. B.), Cloud Wood, common (C. F. T.). *E. fraxinata*, Burton and Derby (G. B.), Burton, at light (C. F. T.), Barrow (G. A. S.). *E. pimpinellata*, Derby (G. B.). *E. valerianata*, Repton Shrubs, common (G. B.), Derby (G. B.). *E. indigata*, Breadsall Moors (G. B.). *E. nanata*, Breadsall Moors, common (G. B.), Cannock Chase (G. B.). *E. subnotata* and *vulgata*, common throughout the district. *E. albipunctata*, Repton Shrubs and Breadsall Moors, common (G. B.). *E. absinthiata*, Willington, on ragwort (C. F. T.), Cloud lime quarry, on tansy (C. F. T.), Barrow (G. A. S.), Breadsall Moors (G. B.). *E. minutata*, Breadsall Moors, common (G. B.). *E. assimilata*, Burton (E. B.), Branstone Road (C. F. T.), Newton Road (J. T. H.), Bretby (G. B.), Linton (J. T. H.), one at Barrow (G. A. S.). *E. tenuiata*, one in Repton Shrubs (C. F. T.), Breadsall Moors (G. B.). *E. lariciata*, Bretby (T. G.), once in Seal Wood (G. B.), Breadsall Moors, common (G. B.). *E. abbreviata*, Burton (E. B. and W. G.), Repton Shrubs (G. B. and C. F. T.). *E. exigua*, common throughout the district. *E. sobrinata*, Burton (E. B. and C. F. T.), Derby (C. F. T. and G. B.), Ashby (G. A. S.). *E. pumilata*, Derby, on ragwort (G. B.). *E. rectangularata*, common throughout the district.

Lobophora halterata (*hexapterata*), Henhurst (E. B. and W. G.), Repton Shrubs (G. B. and J. T. H.). *L. viretata*, Parsons Brake (J. E. N.). *L. carpinata* (*lobulata*), Henhurst (E. B.).

Thera variata, one on Branston Bridge (J. E. N.), Breadsall Moors, common (G. B.).

Hypsipetes ruberata, one in Hoofies Wood (C. F. T.), Winshill Lane

(G. B.). *H. trifasciata*, Burton (E. B.), Newborough, common (J. T. H.), Repton Shrubs, common (G. B.), Repton Rocks (T. G.), Barrow (G. A. S.). *H. sordidata* (*elutata*), common throughout the district.

Melanthia bicolorata (*rubiginata*), Knightley Park (E. B.), Seal Wood (J. T. H.), Repton Shrubs, common (G. B.), Repton Brook (W. G.), Barrow (G. A. S.), Oakedge Park (T. G.). *M. ocellata*, Henhurst (E. B.), Branston road and Bretby Park, (J. E. N.), Barrow (G. A. S.). Breadsall Moors (G. B.), Burton (C. F. T.), Rugeley, common (R. F.), Cannock Chase (T. G.). *M. albicillata*, Knightley Park (E. B. and W. G.), Repton Shrubs (C. F. T., &c.), Seal Wood (J. T. H. and J. E. N.), Decoy plantation, Bretby (T. G.), Ashby (G. A. S.), near Ashborne (H. F. G.).

Melanippe hastata, Seal Wood (E. B. and J. T. H.), Rugeley, not common (R. F.). *M. tristata*, Rugeley, common (R. F.). *M. sociata* (*subtristata*), Seal and Grange Woods (E. B. and W. G.), Oakedge Park (T. G.), Drakelow (J. T. H.), Bretby Park (T. G.), Repton Shrubs (G. B.), Barrow (G. A. S.), near Foremark (H. F. G.). *M. montanata*, common throughout the district. *M. galiata*, Breadsall Moors, scarce (G. B.). *M. fluctuata*, common throughout the district.

Anticlea rubidata, Barrow (G. A. S.). *A. badiata*, common throughout the district. *A. nigrofasciaria* (*derivata*), Burton (E. B. and W. G.), Tatenhill Lane (C. F. T.), Ashby (G. A. S.), Derby (G. B.), Bretby, not common (T. G.), near Ashborne (H. F. G.).

Coremia designata (*propugnata*), Burton (E. B. and W. G.), Drakelow (J. T. H.), Bretby Park, Hoofies Wood, and Repton Shrubs (G. B. and T. G.), Barrow (G. A. S.), Oakedge Park (C. F. T. and T. G.). *C. ferrugata*, Burton (E. B. and W. G.), one in Burton churchyard (J. T. H.), Barrow (G. A. S.), Derby (G. B.). *C. unidentaria*, common throughout the district.

Camptogramma bilineata, common throughout the district. *C. fluviata*, some specimens taken by the Rev. F. M. Spilbury, near Willington (J. T. H.).

Phibalapteryx vittata (*lignata*), formerly at Willington (W. G.), taken by Peel's Cut, Burton, some years ago (J. T. H.), Little Eaton (G. B.).

Triphosa dubitata, common throughout the district.

Eucosmia certata, Burton, 1885 (C. F. T.), one at Barrow (G. A. S.).

Scotosia rhamnata, Dovedale (E. B. and G. B.).

Cidaria miata, Dovedale (G. B.). *C. corylata*, Bretby Park (C. F. T.), Hoofies Wood (G. B.), Repton Shrubs (G. B. and T. G.). *C. truncata* (*russata*) and *C. immanata*, common throughout the district. *C. suffumata*, Burton, not uncommon (E. B.), Repton Rocks (W. G.), Bretby (T. G.), Repton Shrubs (G. B.), Tatenhill Lane, not uncommon (C. F. T.), Barrow (G. A. S.), Breadsall Moors (H. F. G.). *C. silaceata*, Henhurst (E. B., J. T. H., and W. G.), Repton Shrubs (G. B.), Decoy plantation, Bretby (T. G.). *C. prunata*, Burton, common (E. B.), in gardens (W. G.),

formerly at Burton (C. F. T.), occasionally (J. T. H.), Ashborne (H. F. G.). *C. testata*, Barrow (G. A. S.), Breadsall Moors (G. B.). *C. populata*, Burton (E. B.), Breadsall Moors, common (G. B.). *C. fulvata*, common throughout the district. *C. dotata*, Burton (E. B. and W. G.), Barrow (G. A. S.), one in Henhurst (G. B.), fairly common at Bretby (T. G.). *C. associata* (*dotata*) common in gardens.

Pelurga comitata, Burton (E. B.), Shobnall (J. T. H.), Stapenhill and Willington (C. F. T.), common (G. B.).

Eubolia cervinata, not uncommon (E. B. and W. G.). Burton (C. F. T.), Shobnall, common (J. T. H.), Barrow (G. A. S.), Brizlingeote (G. B.). *E. limitata* (*mensuraria*), common throughout the district. *E. plumbaria*, Cannock Chase and Dovedale (E. B.), Barrow (G. A. S.), Tatenhill (T. G.), Breadsall Moors (G. B.). *E. bipunctaria*, Dovedale (E. B. and J. T. H.).

Carsia paludata, sparingly at Dovedale (J. T. H.).

Anaitis plagiata, Ashby (G. A. S.), Cloud lime quarry (C. F. T.), Dovedale (H. F. G.), once on Breadsall Moors (G. B.).

Chesias spartiata, Burton (E. B.), on railway banks at Willington (J. E. N.), formerly at Stenson Gorse (C. F. T.). *C. rufata*, one at light at Burton (P. B. M.).

Tanagra atrata (*chærophyllata*), Henhurst, common (E. B.), in mowing grass (W. G.), canal bank, near Willington (J. E. N.), Bretby and Bagot's Parks (T. G.), very abundant near Ticknall (J. T. H.), Dovedale, common (G. B.), Dyden Wood, near Ashborne (H. F. G.).

PYRALIDES.

Aglossa pinguinalis, common in stables.

Pyralis glaucinalis, Burton (E. B.), Branstone Road, abundant (J. T. H.), abundant at Willington, 1865 (W. G.), once at Derby (G. B.). *P. farinalis*, common throughout the district.

Scoparia ambigua, common throughout the district. *S. cembra*, Bretby, common (J. T. H.), one on Ashby Road (G. B.). *S. dubitalis* (W. G.), Cannock Chase; common (T. G.), Bretby Park (T. G.). *S. conspicua*, Repton Shrubs (G. B.), wood near Uttoxeter (J. Sang.). *S. murana*, Burton (E. B. and J. T. H.). *S. ingratala*, Parsons Brake (?) (C. F. T.). *S. frequentella*, Burton (E. B.). *S. truncicolella* (G. B.). *S. pallida*, railway cuttings (W. G.).

Nomophila noctuella (*hybridalis*), in pastures at Newton (W. G.), in clover fields at Newton (J. T. H.), once at Burton (G. B.), once in Bretby Park (T. G.).

Pyrausta aurata (*punicealis*), Dovedale (G. B.). *P. purpuralis*, Knightley Park (E. B.).

Herbula cespitalis, Repton Park (W. G.).

Ennychia cingulata, Dovedale (E. B.).

Endotricha flammealis, once at Derby (G. B.).

Eurrhyncha urticata, common throughout the district.

Scopula lutealis, *S. olivalis*, and *S. prunalis*, common throughout the district. *S. ferrugalis*, once at Willington, October, 1865 (W. G.).

Botys ruralis (verticalis), common throughout the district. *B. fuscalis*, Drakelow (E. B.), scarce (W. G.), common at Derby (G. B.).

Ebulea crocealis, Drakelow (E. B.). *E. sambucalis*, common throughout the district.

Pionea forficalis and *Cataclysta lemnata*, common throughout the district.

Paraponyx stratiotata, Burton (E. B. and C. F. T.), Repton (W. G.), Derby (G. B.), common (J. T. H.).

Hydrocampa nymphæata and *H. stagnata*, common throughout the district.

Acentropus niveus, Trent, near Burton (E. B.), Trent, at Willington (W. G.), abundant some years on Trent, at Burton (C. F. T.).

PTEROPHORI.

Chrysocoris festaliella, Henhurst (E. B.).

Plutyttilia ochrodactyla, (W. G.). *P. gonodactyla (trigonodactyla)*, near Gresley Common (J. T. H.), Ashby Road, abundant (G. B.).

Amblyptilia acanthodactyla, one at Willington (W. G.), one at Burton (G. B.).

Mimæseoptilus bipunctidactylus, (W. G.). *M. pterodactylus*, Burton (E. B.), Shobnall marl pit, common (G. B.).

Ædematophorus lithodactylus, Drakelow (E. B. and G. B.), near Burton (W. G.).

Pterophorus monodactylus, common throughout the district.

Leioptilus tephrodactylus, Breadsall Moors (G. B.).

Acitilia tetradactyla, Burton (E. B.). *A. pentadactyla*, common throughout the district.

Alucita hexadactyla (polydactyla), common throughout the district.

(To be continued.)

A ROYAL CHARTER FOR THE ENTOMOLOGICAL SOCIETY OF LONDON.

At a meeting of the Entomological Society, held 5th August, 1885, Mr. J. Jenner Weir, Vice-President, in the chair.

Mr. J. W. Dunning, at the invitation of the Vice-President, announced that the Society's application for a Royal Charter had

been successful. He held in his hand the Charter which had been granted by Her Most Gracious Majesty, and begged leave to present it, and formally place it in the custody of the Society.

The document was then read by the Secretary, and was as follows:—

Victoria, by the Grace of God of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith. TO ALL TO WHOM these presents shall come Greeting :

WHEREAS JOSEPH WILLIAM DUNNING, of Lincoln's Inn, in the County of Middlesex, Barrister-at-Law, Esquire, Master of Arts, formerly Fellow of Trinity College, Cambridge, Fellow of the Cambridge Philosophical Society and of the Linnean and Zoological Societies of London, has by his Petition humbly represented unto US, That in the year 1833 certain of our loyal subjects formed themselves into a Society for the Improvement and Diffusion of Entomological Science, and subscribed and expended considerable sums of money for such purposes, and have collected and become possessed of a valuable library and other property, and have been and continue to be actively employed in promoting the objects for which the said Society was founded, especially by the publication of Volumes of Transactions composed of Original Memoirs, read before the Society. AND WHEREAS the said Petitioner, believing that the well-being and usefulness of the said Society would be most materially promoted by obtaining a Charter of Incorporation, hath therefore, on behalf of himself and the other Members of the said Society, most humbly prayed that WE would be pleased to grant a Royal Charter for incorporating into a Society the several persons who have already become Fellows, or who may at any time hereafter become Fellows thereof, subject to such Regulations and Restrictions as to US may seem good and expedient. NOW KNOW YE that WE, being desirous of encouraging a design so laudable, and of promoting the improvement and diffusion of Science in all its branches, have of Our especial Grace, certain Knowledge and mere Motion, given and granted, and We do hereby give and grant, That the said JOSEPH WILLIAM DUNNING and such others of Our loving subjects as are now Fellows of the said Society, or who shall at any time hereafter become Fellows thereof in pursuance of the provisions of this Our Charter and according to such Bye-Laws as are hereinafter mentioned, shall be a Body Corporate by the name of "The Entomological Society of London," having perpetual succession and a common seal, with power to sue and be sued in their Corporate name, and to acquire and hold any goods and chattels whatsoever.

And our Will and Pleasure is, That JOHN OBADIAH WESTWOOD, Esq., Master of Arts, Hope Professor of Zoology in the University of Oxford,

shall be Honorary President of the said Corporation during the term of his natural life. And that ROBERT MACLAHLAN, F.R.S., shall be the first President of the said Corporation and shall continue such until the Annual Meeting to be held in the month of January next.

And our Will and Pleasure is, And we do hereby declare, that there shall always be a Council to direct and manage the concerns of the said Corporation. And that the thirteen persons, who were elected to form the Council of the said Society at the Annual Meeting held in the month of January last, shall form the first Council of the said Corporation, and shall continue in Office until the Annual Meeting to be held in the month of January next.

And our Will and Pleasure is, And we further grant and declare, that the existing Bye-Laws of the said Society, as revised and amended at a General Meeting held on the 2nd day of May, 1883, shall be the Bye-Laws of the said Corporation, until the same shall be revoked or altered as hereinafter mentioned. And that it shall be lawful at General Meetings of the said Corporation to revoke or alter any former Bye-Laws, and to make such new Bye-Laws as shall be deemed useful and necessary for the regulation of the said Body Corporate.

Provided always: And we lastly declare it to be Our Royal Will and Pleasure, That no Bye-Law or Resolution shall, on any account or pretence whatsoever, be made by the said Corporation in opposition to the general scope, true intent, and meaning of this Our Charter or the Laws and Statutes of this Realm, and that if any such Bye-Law or Resolution shall be made, the same shall be absolutely null and void.

In Witness whereof We have caused these our Letters to be made Patent.

WITNESS Ourselves at Westminster the twentieth day of July, in the Forty-ninth year of Our Reign.

By Warrant under the Queen's Sign Manual.



The Vice-President congratulated the Fellows, as he might now call them, on the position which the Society had attained, and on the privileges which had been granted. He invited remarks.

Mr. Dunning said there was one thing in connection with the Charter of which he could not allow the Society to remain in ignorance. When, in 1883, it was decided to take action in the matter, he had invoked the assistance of our member, Mr. Frank Crisp, and left the conduct of the affair entirely in his hands. He thought the result which had been announced was a sufficient

justification of the step. In truth Mr. Crisp had taken the burden upon himself, and relieved the speaker from all trouble. Now that the object had been obtained, Mr. Crisp had, with characteristic generosity, written to say that he has no charges whatever against the Society. He therefore moved that the hearty thanks of the Society be given to Mr. Crisp for his valuable and gratuitous services. This was seconded by Mr. Stainton, and carried unanimously. The Secretary was instructed to communicate the vote to Mr. Crisp, who was not present at the meeting.

Jonkherr May, while gladly acknowledging Mr. Crisp's kindness, thought that it was only Mr. Dunning's modesty which induced him to take this means of diverting attention from his own share in obtaining the Charter. It was to Mr. Dunning also that the Society was indebted, and he moved that the hearty thanks of the Society were due, and should be given to him. Mr. Meldola seconded the motion, and it was carried unanimously.

Mr. Dunning, in acknowledging the vote, said that when temporarily occupying the chair, some six years ago, he had said, "Incorporation by Royal Charter is not beyond our hopes." It was only a passing thought, and he had little expectation that the hope would so soon be realised. To himself, it was an unmixed pleasure to have been instrumental in obtaining that which alone was wanting to complete the fabric of the Society, and give it that status to which its history of fifty years afforded a claim, the justice of which has now received such graceful recognition. Hitherto we have been only a fortuitous concurrence of atoms; now we have a legal existence, and are a body corporate, one and indivisible, and, as far as any human thing can be, perpetual. But if our privileges have increased, so also have our responsibilities; and those responsibilities can only be discharged by the united efforts of the individual members who in the aggregate form the Society. We have to take care that the future of the Society shall be worthy of its past, that by the constant introduction of new blood our body shall never grow old, but shall with ever-renewed vigour march with the times, welcoming and aiding in every advance of Science, and shall for many an age to come unite under one banner the Entomologists of the whole Realm over which the Granter of our Charter rules.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PAPILIO MACHAON, &c., AT WICKEN FEN.—At the end of June I paid a flying visit to Wicken Fen under the most favourable conditions. There had been little rain, and the prevailing wind having been N.E., some of the most marshy parts were accessible. My visit, although short, showed me that *Papilio machaon* was far from dying out, as I observed a very considerable number, although difficult to capture, owing to the nature of the ground. Several I noticed of large size, one measuring three inches and a half across the wings, but many were considerably torn and bruised, so that I had a difficulty in getting a good series. I also found the larva, some of which I have succeeded in feeding up; also the larva of *Saturnia carпинi*, and in the hedgerows *Liparis chrysorrhœa*. The usual method of lamp and sheet was unsuccessful, owing probably to the wind being from the N.E. I obtained *Meliana flammea*, *Hydrelia uncula* (*unca*), and found *Hyria muricata* (*auroraria*) in fine condition, although not plentiful.—ERNEST JOY; 15, Brownswood Park, N., Aug. 10.

COLIAS EDUSA AT WARE.—On August 4th I captured, in the fruit garden here, a fine female specimen of *Colias edusa*.—GEORGE H. TITE; Amwell House, Ware, Herts.

COLIAS EDUSA NEAR LYNTHURST AND AT SEVENOAKS.—I captured a large female specimen of *Colias edusa*, in good condition, near Lyndhurst. I have also taken two specimens here, one on the 2nd and the other on the 16th of this month.—LEWIS F. HILL; Sevenoaks, August 22nd, 1885.

ARGYNNIS LATONA (LATHONIA) AT BRIGHTON.—I caught a good specimen of the above-named species on the north side of Brighton race-course, on the road leading over the downs to Ovingdean, in the afternoon of the 3rd August. It was flying over a patch of wild flowers and thistles, settling on a clover flower just before I took it.—N. P. FOX; 12, Marine Square, Kemp Town, Brighton.

HABITS OF VANESSIDÆ ON EMERGENCE.—In the 'Entomologist' (xv. 188, 260) I called attention to a singular habit of *Apatura iris* upon emerging from the puparium,—to wit, its clinging to the empty case with the head uppermost for five or six hours, and then reversing the position (still keeping hold

of the chrysalis) and remaining with head down and wings upward for a similar time. In answer to my request for information as to the habit of other butterflies upon emergence, Mr. P. N. Pierce, of Liverpool, gave his experience with *Vanessa io* and *V. urticae*, and *Erebia medea*, and he has now kindly furnished me with notes concerning two more, viz., *V. cardui* and *V. polychloros*. "*V. cardui*," he writes, "emerges generally in the early morning. On emerging it clings to the head of the pupa-case, hanging down with its body in a horizontal position; wings hanging quite straight down; when dry it leaves the case. *V. polychloros* seems to be like *A. iris*, with the exception of the clinging to the pupa-case. It emerges early in the morning, leaves the pupa-case and crawls up the branch, and remains with the wings hanging down; but, unlike *V. cardui*, which clings to the pupa-case in a horizontal position, *V. polychloros* assumes the perpendicular, with its head uppermost. After remaining about seven to nine hours it reverses its posture, still keeping the perpendicular, only with its head downward and wings up for five or six hours." There must be some reason for the reversal in position. What is it? Possibly that suggested by Mr. Pierce is the correct one,—that the wings being somewhat weighty drag more when hanging down than if reversed. The subject is certainly interesting, and I trust that other lepidopterists will contribute information upon it.—JOSEPH ANDERSON; Chichester.

LYCÆNA BELLARGUS (ADONIS). — At the time Newman's 'British Butterflies' was written nothing seems to have been known (in so far as concerns our own country) of the life-history of *Lycæna bellargus* (adonis). I should be much obliged if some one would tell me whether since the publication of this work the larva has been discovered, and any account or description of it given in entomological journals. — JOSEPH ANDERSON, jun.; Chichester.

LYCÆNA CORYDON IN EPPING FOREST.—I took a specimen of the above insect near Loughton on the 29th July last, on a swampy spot covered with rushes. As Newman in his 'British Butterflies' states that he took several there, I suppose there is nothing unusual in this occurrence; but although I have worked the Forest for five years, I have never before taken this insect there.—E. B. BISHOP; 3, Primrose Terrace, George Lane, Woodford, August 15, 1885. [It is unusual.—J. T. C.]

ACHERONTIA ATROPOS AND COLIAS EDUSA AT CHICHESTER.—The larvæ of *Acherontia atropos* have been plentiful upon potatoes in this district. One which I had was entirely minus the usual caudal appendage, the place where the tail should have been being decorated with two bright yellow spots and a perpendicular black streak. *Colias edusa* has also appeared in some numbers in fields of clover, the periodical visits of these two species seeming to be coincident.—JOSEPH ANDERSON, jun.

ACHERONTIA ATROPOS IN SOMERSET.—Although resident here since 1867 I have not met with the “death’s-head” larva till this year. The first was brought to me on August 10th, another on the 16th, two on 22nd, one on 23rd, and one on 24th. Two have since gone below ground, three seem full-fed, and the other seems much younger. They came from gardens in different parts of the town.—W. MACMILLAN; Castle Carey, Somerset.

SPHINX CONVULVUL.—On August 11th I captured a very fine specimen of *Sphinx convulvuli*. Is not this a very early appearance? In September, 1875, I captured six specimens, but have not seen one since then until this year.—W. G. NASH; Clavering, Essex, August, 1885.

OCNERIA DISPAR AT MAIDENHEAD.—Whilst looking over some insects captured at Maidenhead during the last few years by the Rev. E. de Ewer, I noticed a male specimen of *Ocneria dispar*, which flew to a lighted window at Craufurd College some three years ago. It is well known to our best collectors that this species has not occurred in a natural state in England for many years past; I believe that the last record is that of a larva taken by myself on sallow at Cherry Hinton, near Cambridge, some ten years since (see Skertchley’s ‘Fenland Past and Present.’). It would be interesting to know whether any of your readers have come across this species of late years without publicly recording its occurrence.—(Rev.) GILBERT H. RAYNOR; Rosemont, Maidenhead, Aug. 5, 1885.

ERASTRIA VENUSTULA.—In reply to Mr. Geo. V. Elstowe (Entom. xviii. 201), I am afraid, as far as my experience goes, that the larva of this beautiful little moth is a fearful cannibal, as I tried to breed some this year, but with very indifferent success. I started with a fine batch of fifty larvæ, and each time I changed their food the number decreased until I am now left

with six only. Their shape is most singular, the first segments being humped, so that when stretched out on the side of the jar in which they are fed they present a curious tadpole appearance. I tried to feed them upon knot-grass, bramble-blossom, and *Tormentilla*, but they refused everything but the latter, and of that only the flowers and seed-heads. Judging from what I have observed, it would be a most difficult larva to find by searching, as it drops from the food at the slightest noise, and curls itself up into a compact ring, after the manner of a sawfly larva.—J. A. COOPER; Sussex Cottage, Harrow Road, Leytonstone, Aug. 4.

EREMOBIA OCHROLEUCA ABUNDANT AT GRAVESEND.—Between the 29th July and the 15th August, at flowers of *Centaurea scabiosa*, in a lane near Chalk, Gravesend, I found *E. ochroleuca* quite commonly. Although most of the specimens were much worn I was able to secure a few in fairly good condition. Next to *Plusia gamma* it was the commonest Noctua at the flower-heads. In the same lane, during the present season, I have taken *Conchylis straminea* (*stramineana*) and *Euchromia purpurana*.—F. G. WHITTLE; 2, Cambridge Terrace, Lupus Street, S.W.

UNUSUAL DATES FOR LEPIDOPTERA.—The following instances, taken from other notes, of the appearance of Lepidoptera which seem to be out of their usual time, may perhaps be interesting:—1881, September 15th, *Argynnis aglaia*, fine female, in S. Wales. 1882, July 11th, *Lycæna minima* (*alsus*) (alone), Somersetshire, perfect condition. 1883, October, first week, *Abraxas sylvata* (*ulmata*). 1884, September 12th, *Epione apiciaria*, just emerged, South Wales; September 19th, *Cidaria testata*, fresh specimens amongst dwarf shallows on sea-coast; October 14th, *Gortyna ochracea* (*flavago*), Dorsetshire, in perfect condition. 1885, January 26th, *Xylina ornithopus* (*rhizolitha*), Somersetshire; February 24th, *Xylocampa areola* (*lithorhiza*); April 24th, *Melanthia ocellata*, just emerged; June 17th, *Gonopteryx rhamni*, nine months of existence.—T. B. JEFFERYS; Clevedon, July, 1885.

CLEOCERIS (EPUNDA) VIMINALIS AND MELANIPPE TRISTATA.—This year I have again had the pleasure of breeding some fine black forms of *C. viminalis*. I have also a very few of a lighter type amongst them, but when compared with the southern or New Forest specimens are much more distinctly black and white (resembling the colour of *Polia chi*) without that ochreous or metallic shade. The insect is very

sluggish; when disturbed it falls to the bottom of the box, and remains motionless for some time; in fact, I never saw one make an attempt to fly; time of emergence about 4 to 6 p.m. I am also having a second brood of *M. tristata* out just now. I do not remember seeing a record of a second appearance anywhere; this year they were very plentiful. I found them in a fresh locality close to the town.—J. HARRISON; Barnsley, Aug. 8, 1885.

PÆDISCA OPPRESSANA IN EPPING FOREST.—While examining the trunk of an aspen in the Forest on Bank Holiday (Aug. 3rd), a Tortrix flew off, but I marked it down; and on searching the grass I was surprised to find a tolerably good specimen of this insect. As I hear the poplar trees in its old locality have been cut down, it was very desirable a new place should be found for this very local species.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., August 15, 1885.

ANACAMPSIS (GELECHIA) ALBIPALPELLA.—I have bred a good series of this much-wanted species this season from larvæ collected in Epping Forest. It is a most difficult species to rear, unless the larvæ are gathered full grown, which is about the end of June or beginning of July. They can be kept in a close-fitting tin for three or four days, provided they are not allowed to get mouldy, and then the contents of the box put into a cage; and in due course the moths will emerge freely. The larvæ feed on *Genista anglica*, betraying their presence by the blotched appearance of the young shoots.—WM. MACHIN; 29, Carlton Road, Carlton Square, Aug. 14, 1885.

CRAMBUS MYELLUS.—I am very pleased to be able to record the capture, in Glen Tilt, last month by Mr. Herd and myself, of five specimens of this rare and pretty *Crambus*.—S. T. ELLISON; Perth, Aug. 7, 1885.

TORTRIX VIRIDANA.—The Rev. G. H. Raynor mentions (Entom. xviii. 194) having seen numbers of rooks feeding on larvæ of *T. viridana*, in a wood near Warley, and that he had never noticed rooks feeding on these larvæ before. It might be interesting to him to hear, that when I was collecting in the wood he mentions I noticed the same thing, and likewise found several dead and dying rooks under the trees. I examined one or two, but failed to find any trace of external injury, although I noticed that they were wasted to mere skeletons. I cannot, of course, say

positively that their death was caused by their diet, or whether they were suffering from an epidemic, but taking the two circumstances together it seems feasible that a plethora of food, which may have been palatable to them although perhaps injurious, may have caused their death. I should be pleased to hear if anyone has observed such an effect before. I may mention in passing that I captured a beautiful specimen of *Phoxopteryx upupana*.—J. A. COOPER; August 4, 1885.

COLEOPHORA VIBICIGERELLA, Zell.—I have reared one very fine specimen of this insect from larvæ found on *Artemisia maritima*, proving that the species is not confined to *A. campestris*. The case is very similar to that of *C. ditella*; black, $4\frac{1}{2}$ –5 lines long, six times as long as broad, somewhat compressed, sharply keeled on the ventral surface, towards the anal extremity more compressed and bent downwards, anteriorly somewhat attenuated. The position of the case slightly less recumbent than that of *C. ditella*.—WM. MACHIN; 29, Carlton Road, Carlton Square, E., August 14, 1885.

SCYTHROPIA CRATÆGELLA.—When larvæ beating in Epping Forest in October, 1884, I noticed a small crab-tree completely enveloped in a beautiful silken web, in which was enclosed a large number of minute hairy larvæ. I gathered a number of the withered leaves, and with the approach of the following spring the larvæ crawled out and fed freely on whitethorn, mining the leaves, about six or seven larvæ tenanting each leaf. After the first moult they left the mines, and fed on the leaves in the ordinary manner of a lepidopteron. When full-fed they crawled into the middle of the web, suspending themselves singly, and turned into curiously-shaped pupæ, not unlike miniature sea-horses in appearance. The larvæ when full-fed were of a brown colour, with broad yellow dorsal stripe; and the perfect insect is most sluggish, and difficult to induce to leave the web, and when shaken out quickly returns, and that even from a distance of several yards, hurrying into the web, apparently considering themselves safe only when hidden within its silken folds.—J. A. COOPER; August 20, 1885.

NOTES FROM MY DIARY.—March 31st, *Notodonta bicolor* at Orpington. June 30th, took a fine *Cossus ligniperda* at Chislehurst on a tree. July 3rd, *Chrysomela goettingensis* and *C. staphylæa* at Chislehurst, amongst grass and nettles at the foot

of a wall. July 5th, collected Hymenoptera at Bedford Park, Chiswick. Sent these and others from the same locality to Mr. E. Saunders, to whom I am indebted for the names. They are as follows:—*Trypoxylon figulus*, *Passalæcus insignis*, *Crabro podagricus*, *C. cephalotes*, *Odynerus parietinus*, *Andræna albicans*, *Megachile circumcincta*, *Osmia rufa*, *Bombus pratorum*, *B. lapidarius*, *B. terrestris*, *Chrysis ignita*, *C. cyanea*. On another occasion I took *Belyta dorsalis*. The *Chrysides* are very beautiful insects; *C. ignita* is very common on sunny walls, but I only saw one *C. cyanea*. I should never have caught this one had it not persistently come back to the same place after being alarmed. I saw it on a window-sill, and lifted my net to catch it, but before I could strike it was gone—in an instant—I knew not where. I was just mourning its loss when there it was back again in exactly the same spot, and so three or four times, until it was captured. July 13th, *Lomaspilis marginata* came to light at Chislehurst. July 19th, took a nearly adult larva of *Vanessa cardui* on *Carduus arvensis* at Bedford Park. July 20th, an individual of *Zeuzera pyrina* (*æsculi*), female, at Chislehurst. July 25th, *Ourapteryx sambucata* and other species very abundant at gas-lamps at Roehampton, near Barnes. August 3rd, *Sesia myopæformis* on leaf of willow tree at Bedford Park. This is the third Bedford Park example I have seen. August 6th, my brother brought me a dead example of *Acherontia atropos*, which he had picked up at Chislehurst.—T. D. A. COCKERELL; 51, Woodstock Road, Bedford Park, Aug. 6.

AN APTEROUS SAWFLY.—Before passing from hymenopterous insects I may mention that, though Sawflies are not numerous in the Zarafshan Valley (Turkistan), yet there is one form particularly remarkable, for, with a normal male, related to the group *Selandriidæ*, is a female without traces of wings. Affected by this absence of wings, the thorax undergoes important changes, and appears greatly swollen, and all the females generally have the appearance of little bags. Its relation to this family is said to be astounding, since it is the only example of the wingless form in the whole family of Sawflies. All the other specialities of structure, however, as well as the wings of the male, confirm it.—(Rev.) Dr. HENRY LANSDELL, in 'Nature.'

TELENOMUS PHALÆNARUM, *Nees* (= *BELENUS*, *Walk.*).—This small egg-parasite has been bred in some numbers from eggs of

Bombyx trifolii found at Tenby and sent to Mrs. Hutchinson, who very kindly forwarded the batch of eggs to the writer. When received on the 23rd July a great number of the flies were out, and many eggs entire, thereby showing the inhabitants had not left their dwelling; eighteen of the eggs that were entire were placed in separate boxes, with a view of recording the number each egg contained, but I am sorry to say the flies in these and many others, on examination, proved to be dead within the egg; the number contained within each egg varied from seven to ten; the flies, when they leave the egg, do so from a single round hole. Mr. Fitch, who kindly named this species, says, "Walker described five other species, belonging to the same section of the genus. Goetze bred it from *B. castrensis* eggs, and it has several times been recorded from *P. bucephala* eggs; Nees obtained it from some large *Bombyx*, also from eggs laid on sallow and from poplar." About four years since I found six eggs of *S. ocellatus*; these were infested with an egg-parasite. Some of the genus are solitary in their attacks.—G. C. BIGNELL; Stonehouse, Plymouth, August 15, 1885.

MICROGASTER ALVEARIUS.—I have this day bred the extraordinary number of one hundred and thirty-three from a larva of *Boarmia gemmaria* (*rhomboidaria*) found on jessamine at Laira. I have on a former occasion obtained ninety-five, and thought that was a great number to be supported by the unfortunate victim; but now obtaining an additional thirty-eight I think it worth recording.—G. C. BIGNELL; August 21, 1885.

MIMICRY.—In the ably written article on "Mimicry" in *Insects*, by Mr. Trimen in the 'Entomologist' for March, 1885, I notice that he says the term "Mimicry" was first used by Mr. Bates as applied to the insect world. Now in Kirby and Spence's 'Introductory Letters to Entomology,' published in 1815, the word is frequently used, as for instance, on page 5:—"Nay sometimes this *Mimicry* is so exquisite that you would mistake the whole insect for a portion of the branching spray of a tree." I merely quote this, as Kirby and Spence have done more for Entomology than most men, rescuing and elevating it, at a time when to study insects was thought to be indicative of a weak mind, and assisted it to become what it is now, one of the first and most delightful and interesting of studies. *Palmam qui meruit ferat*.—GEO. BARNARD; Queensland, May 12, 1885.

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LYCÆNA ARGIADES, PALL.

A BUTTERFLY NEW TO THE BRITISH FAUNA.

BY THE REV. O. PICKARD-CAMBRIDGE.



LYCÆNA ARGIADES.

(From a continental specimen.)

Two specimens (male and female) of this butterfly, which appears to be new to Britain, were taken on Bloxworth Heath, Dorset, on the 18th and 20th of August. The female (which is rather worn) was taken on the 18th by my son Charles Owen, and the male on the 20th, close to the same spot, by my son Arthur; this latter specimen is in good condition. Repeated searches in the neighbourhood since have failed to bring any further success. One of the plants on which I understand the larva feeds, great bird's-foot trefoil (*Lotus major*), is abundant near the spot where these two specimens occurred; and it seems to me probable that we have chanced upon the last of a small brood of this pretty little butterfly. It is stated, in Kirby's 'European Butterflies and Moths,' to occur from May to August. I am in hope, therefore, that by searching for it early another

season we may obtain more specimens. When captured it is easily enough distinguished by the little tails to the hinder wings, and the markings on under side, in which last it much resembles *L. argiolus*; but when on the wing I doubt whether the most experienced collector would distinguish it with any certainty either from a slightly worn or dull example of *L. icarus* (*alexis*) or from *L. ægon*, both of which species abound on and near the spot where we found *L. argiades*. I did not myself see the female before its capture, but my son thought it was *L. ægon*; and I do not doubt but I should have thought so myself. The male I saw as it flew up lazily (the sky was cloudy at the moment) from among the grass, less than a yard from where I was boxing another insect. I could not distinguish it then from *L. icarus*; but I called to my son Arthur to catch it, which he did at once; and in less than two minutes it was recognised and safely boxed. In our subsequent searches we have captured and examined (and for the most part either pinned for cabinet use or deported to a distance and released) over 500 *icarus* and *ægon*. The spot is one I have gone over constantly for many years, both collecting insects and in ordinary walks, and should never have thought of taking the trouble to catch anything looking so like a worn or dark *icarus* or *ægon*. This, presuming upon one's knowledge of what one's own district contains, is perhaps the reason why many a rare insect is passed over, until some such accident as the eagerness of a beginner to catch everything he sees, turns it up, and makes the old collector look rather small. Mr. Frederick Bond's opinion is that poor *icarus* will now have a bad time of it, when the occurrence of so similar an insect is made known. Doubtless it will be so; and I hope the result may be to turn up *L. argiades* in many other localities on our southern coasts. From a large fine specimen of the male *icarus*, however, I think the male of *argiades* may easily be distinguished on the wing; and the female will be probably also found to be of too brown a hue to be mistaken for the ordinary varieties of *icarus*; but certainly all the dark lilac varieties of *icarus*, male (which includes all worn examples), as well as nearly all males of *ægon*, must be caught and examined to make it certain that *argiades* has not been passed over. Perhaps future experience may show us some peculiarity in flight by which to distinguish the species when on the wing, or some information

on this point may be obtained from continental collectors where *argiades* is abundant.

The following is a short description of the two specimens now recorded :—

LYCÆNA ARGIADES, *Pall.*

Kirby's 'European Butterflies and Moths,' p. 53, pl. 14, fig. 11 :—

Male.—Width, $12\frac{2}{3}$ lines; upper wings much more rounded than those of *L. icarus*, and rather more than those of *L. ægon*. Colour lilac-blue, lighter or darker according to the incidence of the light upon the wings, and narrowly edged with black; the hinder wings have a small prominent point on the hind margin, near the inner corner, continued in a small, slender, but quite distinct, black, white-fringed tail; outside the tail, near to and parallel with the margin of the wing, are two not very distinct black spots. The wings are somewhat transparent, and the nervures are distinctly marked by fine dusky black lines; the fringes of the wings are pretty perfect, and appear to be a mixture of black and white. All the wings are dusky blackish towards the margins, but not distinctly bordered like *L. ægon*. The under side is whitish gray, silvery blue towards their insertion in the thorax; two distinct orange spots edged above with black are placed about the middle of the hind margin on the under side of the posterior wings, one of these (immediately above the tail) has a largish distinct black spot at its base; a few small black spots are scattered over the rest of the under side of the posterior wings, and a row of others, some of which are rather elongate, runs parallel with the outer margin of the anterior wings, and between this row and the margin, and also parallel with it, are some indistinct dusky markings.

Female.—Width, 13 lines. Upper wings dusky blackish brown, sprinkled with some lilac scales towards their base; lower wings similar, but with more of the lilac scales, which form a kind of broad and widening lilac band from the base to the outer margin; a black spot occurs close to the "tail," with a round orange spot immediately above it. The tail is similar to that of the male.

I gather from Kirby's 'European Butterflies and Moths' that the male also usually has an orange spot visible on the upper

side near the tail; and that those specimens wanting it (like the example here recorded) form the variety *L. coretas*, Ochs.

Bloxworth Rectory, Wareham, Sept. 7, 1885.

PS.—Since correcting the proof of the above I have ascertained, beyond a doubt, that an example of *Lycæna argiades* was also taken near Bournemouth, on the 21st of August this year, by Mr. Philip Tudor. This specimen was named, but doubtfully, for him by Mr. MacRae, of Bournemouth, as a worn example of *L. bætica*; but on my yesterday showing Mr. MacRae (who first informed me of the above capture) the description of *L. argiades*, here given, with the woodcut figure above, he at once admitted that Mr. Tudor's specimen was not *L. bætica*, but *L. argiades*; and a letter received last night from my eldest son (who is a fellow-pupil of Mr. Tudor's, at Forest School, Walthamstow) informs me that he had just seen a specimen of *L. argiades* in the collection of Mr. Tudor, taken at Bournemouth in August, and thought by Mr. Tudor to be *L. bætica*, but which was identical with our specimens of *L. argiades*. The Bournemouth locality is fourteen miles from that of our captures. I have given the above with perhaps unnecessary particularity; but I think the records of additions to our British Fauna cannot be too particular or too accurate.—O. P. C.; September 16, 1885.

[Dr. Lang, in his 'Butterflies of Europe,' from which the above figures are reproduced, says:—"From May to the end of August in Central and Southern Europe (except Britain and Spain), North Western Asia, and South of Siberia, and the Amur. It frequents meadows, and is generally a common insect. There are two or three broods in a year; the individuals of the spring brood are smaller than those which appear later in the season. Larva feeds on trefoil and other Leguminosæ." Mr. W. F. de Vismes Kane, in his new 'Handbook of European Butterflies,' also gives "May to August, according to latitude, with successive broods in the south." *Lycæna argiades* will be placed in our collections between *L. bætica* and *L. ægon*.—ED.]

ON BREEDING THE VARIETIES OF THE ORANGE-MOTH
(*ANGERONA PRUNARIA*).

BY GEO. J. GRAPES.

IN the summer of 1882, at Colchester, Essex, from a few pupæ of this insect I obtained, in due course, ova, and subsequently larvæ, which hybernated during the following winter, secreted among withered leaves of willow, on which tree they had been feeding. Before hybernation they attained a length of about three quarters of an inch, and were of the ordinary whitish or greenish gray colour, characteristic of the larvæ of the normal type of *A. prunaria*. These, with few exceptions, survived the winter, and produced many series of fine imagines.

Having been so successful in breeding this species, the idea occurred to me of pairing some of them with the orange-banded variety of the male, specimens of which I was fortunate in securing rather plentifully at dusk, on the outskirts of an adjacent wood, about midsummer, 1883. In this instance, also, I succeeded in hybernating the larvæ, which varied in colour from pale gray to almost black, apparently according to the variety typified; and in the ensuing summer my efforts were rewarded by the acquisition of several fine examples of the varieties of both sexes, *viz.*, two varieties of the male,—one, deep orange, suffused with unusually dark fuscous irrorations, in some instances slightly confluent; and the other, light fuscous crossed with bright orange bands; and the ordinary variety of the female, *viz.*, plain brown, with light yellow transverse fascia.

This continued success induced me to try the effect of the undermentioned experimental pairings:—Normal female with orange-banded var. male; var. female with orange-banded var. male; var. female with normal male; from which I obtained many more fine examples of the brown varieties of *A. prunaria*, as well as a few aberrations, including an exceedingly pale one, in which the fuscous or brown colour was of the faintest tint, indeed barely discernible, though the outlines of the transverse yellow bands were sufficiently distinct to identify the female variety; also a variation of the normal type of the same sex, in which the ground colour was of the typical yellow, but the dark striated spots larger and more distinct than usual. The last I

managed to pair with an orange-banded variety of the male, and effected other pairings, as enumerated below:—Var. female with speckled var. male; var. female with orange-banded var. male; normal female with orange-banded var. male; normal female with speckled var. male; var. female with orange-banded var. male; var. female with speckled var. male; speckled var. female with orange-banded var. male. Though I secured a plentiful supply of ova from these pairings, I was able only to save about fifty larvæ. The others either escaped through the fine meshes of the muslin sleeve in which they had been confined, or were destroyed by young spiders which overran my garden in the early part of the season.

With this small stock, however, as *prunaria* is reputed to be a very variable moth, I hope, on a future occasion, to be able to chronicle some new variations of this lepidopteron worthy of special note.

2, Buckleigh Road, Streatham Common, S.W., Sept. 15. 1885.

AN UNUSUAL APHIS MIGRATION.

By JOHN R. S. CLIFFORD.

SOMEWHAT to my surprise, it appears that as yet no observations have been communicated to the 'Entomologist' concerning the Aphis migration that took place towards the end of July and at the beginning of August, and which must have been noticed by many naturalists, since it evidently extended over some considerable part of England; at least I have had reports of it from Surrey and Oxfordshire. The presumption is, therefore, justifiable that it occurred in other counties. Concerning Kent and Middlesex I can speak from personal observation. It is to be hoped that notes illustrative of this event may yet be contributed to this and other scientific journals, as we might thereby be helped to a better knowledge of a group of insects that are interesting on account of their peculiar economy, and also their pernicious influence on vegetation, especially on the produce of our gardens, both useful and ornamental.

Before, however, describing this particular incident, it is

necessary to refer to the usual rule of Aphis migration. It is known to entomologists that these insects are viviparous and wingless through the greater part of the season, when obviously migration is to them a thing impossible. The periods of their migration are towards the close of May or early in June, and corresponding dates in September or October, the Aphides being then winged. In answer to a communication of mine, the late Francis Walker remarked that the time of these migrations depends upon the state of the atmosphere, and in this way: so long as the plants upon which the Aphides are feeding afford them an abundant supply of sap they multiply rapidly, but when a change in the weather checks the flow they come forth winged, and are also prompted to change their quarters. There is then actually some truth that on certain cloudy oppressive days of spring and autumn "there is a blight in the air," according to the popular belief, for it is on such days that Aphides travel. The insects are seldom noticeable on any day when there is a strong wind blowing, and I do not think that direction makes any difference, though the statement has been made that easterly winds brings the Aphides; but I have found them on the move in winds from all parts of the compass; yet it is true that the east wind, from its unkindly effects on vegetation, will bring about that check to healthy growth which develops the flying brood; nor does the Aphis suffer from this wind as do many insects; rain, however, is greatly disliked by them. As to the distance they generally journey, Mr. Walker added that their migrations, he believed, were short; but the word as applied to distance is somewhat indefinite; if we have no standard of comparison, it might mean a mile or a few hundred yards. I take it Mr. Walker meant a distance approximating to the latter space. Yet I hope to demonstrate that Aphides may and do travel, at least on some occasions, a mile, and even more, though I cannot give support to the theory of one naturalist that they may not only go from county to county in Britain, but cross to us from the Continent, or *vice versâ*. Though if we speak of flight, *i. e.*, of voluntary motion, an examination of the wings of an Aphis suggests that they could sustain the insect for but a brief time; it seems as though when they make a long journey through the air they must allow themselves to be simply borne along by the current, whichever way it may blow. It is not probable that they form themselves

into a compact body for such journeys; but they certainly move in parties.

Nothing remarkable occurred, so far as I am aware, at the first or later spring migration of 1885; but the migration of July and August was notable for the number of Aphides that were on the wing in some counties, and the period during which this migration continued,—certainly about a fortnight in North Kent. Of course in this time the wind blew from various quarters, but chiefly from the N.N.W. and N.E. Concerning the species I am not able to speak positively; that there were several thus migrating I fully believe, but on most days two were particularly recognisable, *viz.*, a green *Aphis*, which seemed to correspond with *Aphis humuli* or its variety *malahebi*, an insect which, though named from the hop, occurs upon fruit trees, the rose, and a variety of plants. The other was smaller, and a blackish species, resembling, if not identical with, *Myzus cerasi*, occurring upon the cherry and allied plants. By far the greater number were of the green sort; probably on most days there were six or eight of these to one of the darker insects. I have not an exact date, but it was about July 20th when the Aphides appeared notably in the roads and lanes of North Kent, the number varying from day to day. Sometimes after a short walk an individual would be seen with as many as thirty or forty Aphides dotted over his garments; and they entered the eyes and ears occasionally, causing annoyance or even alarm. Circumstances led me to walk across the metropolis, on Wednesday, July 29th, from Commercial Road, E., to Belgravia in the west, and all the distance I found Aphides floating in the air. This, however, is no proof that at the time a wave of Aphides, so to speak, was passing across the country, scattering stragglers as it moved. I only infer from it that the Aphides of the suburban gardens were afflicted with the same restlessness that their country kin showed.

At Gravesend the climax of this migration was reached on Saturday, August 1st, when the swarms of these insects was a subject of common remark amongst those in the streets; and they were most numerous of all at the foot of High Street and upon the shore adjacent. An investigation of the line of their movement made the fact undoubted that they must have crossed to us from the Essex coast; how far they had travelled inland previously can only be conjectured vaguely; but they must have

travelled at least a mile over the water; and as it does not seem likely they intended to settle in or about the town, I suppose that some of the Aphides seen flying two or three miles inland, and moving from the north, had been bred in Essex. That a great many died during this migration appears certain, for I do not find that any place near Gravesend is usually infested with them, though the hop gardens here and there have suffered from "fly," as happens most years.

The change of weather that occurred after the August bank holiday terminated the Aphis migration; and it was followed by the appearance, also in good force, of their natural enemies the "lady-birds," more especially *Coccinella septempunctata*. I did not observe, however, these beetles passing through the air in any number, though I have in former years; and once saw the church of Ifield, in Kent, covered with thousands of *C. bipunctata* that had been driven against it by stress of weather. It need only be added that the cause of this migration of Aphides is obvious: it was assuredly induced by the long-continued drought, which forced the insects into the winged form, and prompted them to travel in search of vegetation more juicy than that they had left, a journey which could have been but partially successful to the tiny travellers.

Gravesend, September 7, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLIAS EDUSA.—This butterfly seems to be plentiful this year. In a small piece of clover, about an acre and a half, I took twenty fine fresh specimens in about an hour on August 18th, and five more on August 24th.—(Rev.) J. SEYMOUR ST. JOHN; Whatley Rectory, Frome.

COLIAS EDUSA NEAR NEWARK.—This species has made its appearance in this neighbourhood after many years absence, several specimens having been captured near Newark in the early part of this month.—J. W. TOMLINSON; Stamp Office, September 14, 1885.

COLIAS EDUSA AND EREMOTIA OCHROLEUCA NEAR CUDHAM, KENT.—I captured two specimens of *Colias edusa* (male and
ENTOM.—OCT., 1885. 2 L

female) yesterday, September 22nd, near Cudham. I also took in the same locality, on the 9th of last August, a very perfect specimen of *Eremobia ochroleuca* at rest on the stem of knapweed. I see in this month's number of the 'Entomologist' (vol. xviii., p. 244) that Mr. F. G. Whittle mentions having found it commonly near Gravesend; therefore Kent may be given as a locality, as only Sussex, Gloucestershire, Suffolk, and Yorkshire are given as localities for this species in Newman's 'British Moths.' *Pyrameis cardui* and *P. atalanta* have been abundant this autumn in West Kent.—F. W. FROHAWK; 1, Park Place, Eltham, Kent, Sept. 22.

COLIAS HELICE AND *SPHINX CONVULVULI* AT CHICHESTER.—On August 25th I took a fine *Colias helice* flying over a clover field. The specimen is a peculiarly white one. During the first week in September several *Sphinx convolvuli* visited the flower-beds in our garden, and one evening two flew into the dining-room, which had just been lighted. One specimen (which my brother captured) is in such splendid condition that apparently it had but recently emerged from the pupa.—JOSEPH ANDERSON, jun.; Chichester.

ACHERONTIA ATROPOS AT HARWICH.—The larva of this moth has occurred here in some numbers this year. I have already had five brought to me, and have heard of others being destroyed. Three have buried themselves; the other two are still feeding.—F. KERRY; Harwich.

ACHERONTIA ATROPOS IN HUNTINGDONSHIRE.—Two correspondents having drawn attention (Entom. xviii. 243) to the number of *Acherontia atropos* larvæ found in their district, I may say I have experienced a similar increase in numbers in Huntingdonshire. For three weeks I have had one, two, or three larvæ brought me each day. This is unusual, but owing probably to the fine weather.—H. E. NORRIS; St. Ives, Hunts, Sept. 2, 1885.

SPHINX CONVULVULI.—I have come across two specimens of this moth this year. One was sent me by a relation from the Isle of Wight, having been caught at Bembridge about August 20th; the other was taken at Wells, September 3rd, and was brought to Dr. Livett, of that city, who kindly gave it to me.—(Rev.) J. SEYMOUR ST. JOHN; Whatley Rectory, Frome.

SPHINX CONVULVULI AT CHRISTCHURCH.—On August 14th I had a fine male *S. convolvuli* brought to me, which had flown into

a room in the street a few days before. Since then I have received four. One deposited four eggs the night before I received it, which were unfortunately thrown away; and although I kept it until it died it did not lay any more. I have heard of several others being taken near here.—A. DRUITT; Christchurch, Hants, September, 1885.

SPHINX CONVULVULI AT ROTHERHITHE.—I have taken a good specimen of this moth here. It flew into an oil shop, in the Lower Road, on the evening of August 28th, probably attracted by the gas-light, and settled on the wall.—A. E. COOK; 31, Lower Road, Rotherhithe, S.E.

SPHINX CONVULVULI AT HOLLOWAY.—A specimen was brought to me alive on September 5th, having been caught in my immediate neighbourhood, and, although captured by a novice, not a scale was disturbed; in fact it looked as if it had just emerged from the pupa. The specimen has been seen and identified by Mr. Cooke, Naturalist, of Museum Street.—J. P. MUTCH; 359, Hornsey Road, Holloway, London, September 15, 1885.

SPHINX CONVULVULI NEAR CHICHESTER.—Whilst looking at some moths taken this year by two young entomologists, of the ages of ten and nine years respectively, in the parishes of Westhampnel and East Lavant, I was pleased to see that each had taken a specimen of this *Sphinx*, one being taken in each parish.—FRANCIS C. WOODBRIDGE; Lewes, Sussex.

SPHINX CONVULVULI AT LEICESTER.—It is with pleasure that I am able to record the capture of two specimens of *Sphinx convolvuli*. One, a very fine specimen, was caught on a door in early morning of August 31st; it is a very fine specimen, and at the time of capture could not have been long out of pupa. The other, badly crushed, was brought to me by some men on the 5th inst.: they were both taken near the centre of the town. These are two of the very few captures as yet recorded from Leicestershire.—W. TRISTRAM; Havelock Cottage, Gosling Street, Leicester, Sept. 13, 1885.

SPHINX CONVULVULI AT NORTHAMPTON.—On Sept. 5th I was fortunate enough to capture four good specimens of *Sphinx convolvuli*, and four more during the next week. All were caught in the same locality, namely, in a nursery outside the town, in which there was a fine bed of sweet-scented tobacco plant, which seemed

very attractive to these moths. A friend also caught two at the same place, and I myself saw several more, which I did not attempt to take, having sufficient for a good series. I may add that this moth is rarely taken in this town; the only one I have heard of before these, was caught by a workman in a gentleman's garden two years ago.—F. BOSTOCK, jun.; Trentham House, Billing Road, Northampton, Sept. 19, 1885.

SPHINX CONVULVULI NEAR MAIDSTONE.—I have not seen a single specimen of this insect since 1875, when I was fortunate enough to secure five in my own and a neighbour's garden. Last evening, however, a noble male specimen was brought to me by one of my parishioners, who had caught it in his house, attracted doubtless by light.—(Rev.) S. CAVE-BROWNE; Detling Vicarage, Maidstone, September 5, 1885.

SPHINX CONVULVULI NEAR FOOTSCRAY AND SIDCUP.—On the 6th of September I saw a fine male *S. convolvuli* hovering at a lily in my garden, which I failed to capture, but succeeded in decapitating the lily. On the following evening I visited a neighbour's garden, where there is a large bed of petunias, and succeeded this time in taking one, as I did also on the following dates,—8th, 9th, 10th, 11th, and 14th. My friend Mr. Hickling, of Sidcup, also took three fine specimens from fences. Two were sent me by a friend, taken at Sunbury.—JAMES TRIMMER WILLIAMS; Footscray, Kent, Sept. 15, 1885.

SPHINX CONVULVULI AT WALTHAMSTOW.—I am pleased to record that a very fresh specimen of this fine species was brought to me on August 24th last, having been taken on a door-knocker in this locality.—O. G. GOLDTHWAITE; Walthamstow.

SPHINX CONVULVULI IN SOMERSET.—A specimen of this insect was captured here at rest on August 28th, and another flew into a cottage on September 6th. I have not met with it previously.—W. MACMILLAN; Castle Cary, Somerset.

SPHINX CONVULVULI AND CHÆROCAMPA CELERIO IN SURREY.—*Sphinx convolvuli* for the last fortnight has been, I may say, a common insect in this locality. While watching them to my surprise I noticed *Chærocampa celerio*; and after several attempts during the last fortnight I have at last taken specimens.—J. VENABLES; Woodlands, Henley, Surrey, Sept. 17, 1885.

SPHINX CONVULVULI AND CHÆROCAMPA CELERIO AT CROMER.—I have pleasure in recording the capture of three specimens of *Chærocampa celerio*, one of which was taken by myself, another by my brother (who has given it to me), and another by the chemist here; the two former ones were taken hovering over a bed of petunias, and the latter flew in at the shop window. *Sphinx convolvuli* has also appeared in great numbers; I have taken sixteen in very good condition, twelve of which I took in three evenings.—F. H. BARCLAY; The Warren, Cromer, Norfolk, Sept. 19, 1885.

SPHINX CONVULVULI AND CHÆROCAMPA CELERIO AT LEWES.—On September 11th I caught a fine specimen of *Chærocampa celerio* flying over a bed of petunias in our garden. I have also taken five specimens of *Sphinx convolvuli* at the same bed this autumn, and three others have been taken by my brother and a friend; the first was caught on August 14th.—WILLIAM E. NICHOLSON; Lewes, Sussex.

SPHINX CONVULVULI AND CHÆROCAMPA CELERIO AT DOVERCOURT.—On the 31st August I was fortunate enough to secure a specimen of *S. convolvuli* at rest. On the 13th September a fine specimen of *C. celerio* was brought to me alive. It was caught whilst flying in the bar of the Queen's Head Hotel, Dovercourt. It is nearly perfect.—F. KERRY; Harwich.

CHÆROCAMPA CELERIO.—An exceptionally fine specimen of this handsome moth was found on my drawing-room window on 12th September, 1885. So fine is it that it must have only just emerged from pupa.—HENRY BENSON; Kylemore, Pevensey, Sussex, September, 1885.

CHÆROCAMPA CELERIO AT RAMSGATE.—I have just seen two specimens of this insect, which were taken near Ramsgate by some young friends, and brought to me for confirmation. One is in very fine condition; the other a trifle worn.—THEODORE WOOD; Freeman Lodge, St. Peter's, Kent, Sept. 19, 1885.

CHÆROCAMPA CELERIO IN LONDON.—I have to report the capture of a specimen of this rare insect on Blackfriars Bridge, London (where it was found at rest by a man employed in our city office) on Friday morning, September 11th. It was brought to me alive, but had suffered somewhat from clumsy handling.—

OLIVER C. GOLDTHWAIT; 2, Grove Villas, Grove Road, Walthamstow, Sept. 19, 1885.

CHÆROCAMPA CELERIO, &c., AT CHRISTCHURCH.—On the 19th September, at dusk, I took a small male specimen of the above insect, hovering over geraniums in my garden: it is in fine condition. I also took one specimen each of *Luperina cespitis* and *Eremobia ochroleuca* during August last.—J. MORTIMER ADYE; Somerford Grange, Christchurch, Hants.

CHÆROCAMPA CELERIO AT CROSBY.—On Friday, Sept. 19th, a scholar of the Merchant Taylors' School, Crosby, brought me a specimen of *Chærocampa celerio*, which he had caught on the 16th. He found it in his garden at Crosby, struggling in a spider's web. It is in very good condition. Not being a collector he presented it to me.—GEO. A. HARKER; Holden Road, Blundellsands, Lancashire, September 21, 1885.

CHÆROCAMPA CELERIO IN NORTH WALES.—I was fortunate enough to capture a fine specimen of this moth on Sept. 18th at rest on a window-sill. I think this is the first reported occurrence of this rare *Sphinx* in North Wales.—W. J. KERR; Tan-y-Bwlch, Merioneth, North Wales.

CHÆROCAMPA CELERIO AT HOLMWOOD.—In my garden, at Holmwood, a lady, while on a visit, captured a fine specimen of *Chærocampa celerio* on the palings. It is now in my collection.—T. W. KING; Bude Haven, Holmwood, Surrey, Sept. 14, 1885.

CHÆROCAMPA CELERIO AT FELIXSTOWE.—A fine specimen of this rare moth was captured at Felixstowe, on September 14th, by a friend of mine, who, not being a collector, sent it to me.—H. MILLER, jun.; Ipswich.

DEIOPEIA PULCHELLA AT FOLKESTONE.—I have to record the capture of a fine female *Deiopeia pulchella* at Folkestone, near the harbour, on the 7th September.—D. CHITTENDEN; Willesborough, Lees, Ashford, Kent, September 13, 1885.

AGROTIS PRÆCOX, &c., NEAR CAMBRIDGE.—On August 7th I captured a specimen of *Agrotis præcox*: it came into my room about 10 p.m., evidently attracted by light. With the exception of a small rent in the right lower wing, it was in excellent condition. The nearest point of coast is about forty miles from here. Is not this rather an unusual distance inland for such a

coast moth? On August 28th a female *Hepialus humuli* emerged in my breeding-cage. The larva had been feeding about a month before in the stem of the water-figwort (*Scrophularia aquatica*). I saw one male of *Colias edusa* near Wivelsfield, Sussex, last month.—G. E. CRALLAN; Fulbourn, near Cambridge, Sept. 8.

LIPARIS MONACHA AT TUNBRIDGE WELLS.—I was surprised to find, a few days ago, a female specimen of this moth on the cricket-ground on this common, as I have never heard of it being taken about here before, and September is rather late for it to be on the wing. The specimen was much worn.—G. H. K. BONE; 3, Hungershall Park, Tunbridge Wells, Sept. 18, 1885.

OCNERIA DISPAR IN WARWICKSHIRE.—I was much interested at seeing in the September 'Entomologist' (xviii. 243) the account by the Rev. Gilbert H. Raynor of the occurrence of this moth at Maidenhead, as I was fortunate enough, whilst collecting in Warwickshire about the middle of last May, to find twelve of the larvæ feeding on hawthorn in a hedgerow in the neighbourhood of Rugby. They were at the time of feeding very small indeed, and at first I failed to recognise them. Out of the twelve two died soon after I found them, and also another just before they all spun up. This took place at the end of June, the moths emerging at the end of the following month. Out of the nine, four were females and five males; and I succeeded in obtaining over fifty eggs.—W. H. BLABER; Beckworth, Lindfield, Sussex, September 4, 1885.

[Is it not possible that these larvæ are introduced from the Continent with the immense number of "quick-set hedge" (hawthorn) plants which are annually imported into this country by the wholesale nurserymen?—ED.]

ASTHENA BLOMERI.—Entomological books, so far as I know, give this insect as single-brooded in the same month. I should be glad to hear from any of your readers if they have ever known a succession of emergences during the season. In the same place, close by this house, I took a specimen on May 28th; one, June 6th; another, June 9th; a fourth, July 13th; and a fifth, August 24th; all of them being fresh and perfect specimens. Possibly the long dry summer may have had something to do with this exceptional occurrence.—(REV.) J. SEYMOUR ST. JOHN; Whatley Rectory, Frome.

HELIOTHIS PELTIGERA, &C., IN YORKSHIRE.—Several days ago my friend Mr. W. E. Clarke, of Leeds, sent me a moth to identify, which he had taken on the 6th of the present month (September) at Kilnsea, in Holderness. It was with great pleasure I at once saw it was a well-marked specimen of *Heliothis peltigera*, a species quite new to the county of Yorkshire; and, so far as I know, not previously recorded as occurring so far north in Britain. Mr. Clarke found the specimen at rest on the sand-hills, and it had evidently not flown since its emergence from the pupa. On August 31st I found larvæ of its commoner relative, *H. marginata*, in great abundance on *Ononis arvensis*, on the cliffs, about four miles north of Scarborough. On August 22nd a fine example of *Sphinx convolvuli* was taken, by Mr. Henry Stevenson, in the town at Huddersfield.—GEO. T. PORRITT; Huddersfield, September 14, 1885.

OCHSENHEIMERIA VACCULELLA IN EPPING FOREST.—On August 3rd (Bank Holiday) I made a short journey to the Forest, and while there I thought I would look over the bole of an oak on which I had several times taken *Laverna stephensiella*. While closely examining the bark I observed, deep in a crevice, what appeared to be an insect (for at rest they so closely resemble in colour the bark as to be hardly recognisable), which, on being touched, moved further in. I cut away the bark and inserted a small pill-box, and endeavoured with a grass-stem to work the insect into the box; and, when I had all but secured my prize, it crept into a small hole from which some coleopterous insect had emerged and disappeared. On removing some web I discovered two others, but, as it was impossible to reach them with a box, I tried to work them out with grass-stems, but on being brought near the surface they skipped off and were lost. As their habits were so different from that of *O. birdella*, which I had met with at Southend by sweeping grass, I thought they might prove to be the rare *O. vacculella*, and felt particularly anxious to make a captive. I worked at the tree for a couple of hours, and was rewarded with half a dozen specimens. These I forwarded to Mr. Stainton, who, with his usual kindness, named the specimens for me. The principal characters of *O. vacculella* are the whitish base of the posterior wings, and the antennæ perfectly simple, with no erect scales.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E.

NOTES FROM ABBOT'S WOOD.—Having heard that Lepidoptera were plentiful in the above locality I joined my brother, on the 20th June, for a few days' collecting. He had been there a week, and from the reports I had received I anticipated a fair amount of work, and am glad to say I was not disappointed. On the 21st we walked through some of the ridings of the wood prospecting, and were pleased to come across a freshly emerged female of *Melitæa athalia* at rest on a flower of hawkweed. *Argynnis selene* was plentiful, but getting worn; *Thecla rubi* had been common, and faded specimens were not infrequent, especially in the White Field; while *Hesperia sylvanus* and the commoner species were in fair numbers. A single specimen of *Gnophria rubricollis* and four pairs of *Zygæna trifolii* were also taken, and ova obtained from the latter. On the 22nd we went into the wood in the hope of taking *M. athalia*, but although the morning broke bright and sunny, clouds gathered just as its habitat was reached, and none were to be seen. However, by scouring amongst its food-plant, the common cow-wheat (*Melampyrum pratense*), which grows here in large masses, we were able to add six fresh specimens to one we had already taken in the White Field. A visit to Eastbourne the next day produced *Lycæna minima (alsus)*, fairly common on the cliffs about Holywell; with *L. bellargus (adonis)* and *L. icarus (alexis)* further on towards Beachy Head. The 24th proved a genuine midsummer day, hot and almost cloudless, and *M. athalia* appeared on the wing in some abundance. We again took a single specimen in the White Field, and filled our boxes in the course of a couple of hours or so with a nice series of picked specimens. A noticeable feature in the habits of this species on the wing is its occurrence in little companies of from two to four or more, so that single specimens were the exception. The 27th, also proving fine and sunny, we paid a further visit to its headquarters in order to take some females, and were pleased to find a few couples at rest on grass-stems, although the proportion of females taken was only 20 per cent. Other species seen included a hibernated female of *Colias edusa*, *Euchloe cardamines* (which was quite three weeks late), *Dasychira pudibunda*, *Timandra amataria*, *Melanippe hastata*. Among larvæ by far the most common was *Eriogaster lanestris*, which occurred in large numbers on the blackthorn, some of the "nests" containing over

fifty larvæ; and examples were to be seen on palings, walls, &c. *Bombyx quercus*, *B. neustria*, *Saturnia pavonia* (*carpini*), and *Dicranura vinula* were, amongst others, noticed; and an oak twig covered with eggs proved to be those of *D. pudibunda*; whilst an erratic female, *B. rubi*, had deposited a batch of eggs on a black fence by the railway station. Many other common species were in fair numbers.—F. W. HAWES; Dovecote Villas, Wood Green, August 15, 1885.

CAPTURES IN BERKSHIRE.—During last July, and at other times, I have collected at Beaumont (Berks), and have noticed a good many not generally common insects there. *Sphinx convolvuli* has been twice taken within the grounds; and last July I obtained a specimen of *Boarmia roboraria*, which came to light. I saw a specimen of *Thecla pruni*, which I was unable to capture. A large specimen of the beetle, *Prionus coriarius*, was taken on the wing at night, and brought to me.—EDMUND GARDNER; Roehampton Lane, S.W., September, 1885.

STRAY NOTES FROM PRESTON.—This season I have reared a number of *Nepticula anomalella*, a few *Coccyx scopariana*, *Hedya servillana*, and seven or eight *Cidaria reticulata*. My captures are but few. In a few hours, at Windermere, I got four *Heliozele resplendella*, one *Nepticula internella*, one *Phoxopteryx diminutana*, some *P. biarcuana*, &c. At Grange, during the same week, I took twenty *Catopia aspidiscana*, and a dozen *Pancalia lewenhoekella*. Of butterflies, I took only *Leucophasia sinapis*, *Argynnis euphrosyne*, and *Lycæna argiolus*. During another day at Windermere, which I had in July, I captured a score or so of *Scoparia conspualis*, and a few *S. basistrigalis*, one *Cidaria reticulata*, *Venusia cambrica*, &c. On an odd day at Witherslack, in the second week in July, I took three *Eupæcilia amandana* (*sodaliana*), flying round buckthorn, about 7 p.m., when I saw others. On the bank by the inn I took *Phothedes captiuncula* (*expolita*), and, on the same day, *Oxyptilus parvidactylus*, and other species, were in plenty. During a few weeks in August I was too unwell to collect any insects; but at Blackpool I got about fifty *Eupæcilia atricapitana*, some *Choreutes myllerana* (*scintillulana*), and *Ephippiphora populana* (*ephippana*) by hundreds. *Sericoris littoralis*, a single specimen feeding by daytime on ragwort flowers. *Agrotis vestigialis* (*valligera*), *A.*

cursoria, and *Miana literosa*, flying in hot sunshine, with an occasional *A. præcox*.—J. B. HODGKINSON; 6, Fishergate Hill, Preston, Sept. 7, 1885.

TIMARCHA LÆVIGATA.—On Sept. 9th of this year, at Pegwell Bay, Thanet, I came across an immense number of this common beetle. They were among the grass and small shrubs on a little stretch of ground on the edge of the chalk cliffs. They were in such numbers that there seemed to be one on almost every square foot of ground.—EDMUND GARDNER; Roehampton Lane, S.W., September, 1885.

NOTES ON INSECTS AT THE LIGHTHOUSES IN 1884.—Under date of June 30th, Mr. Owen Boyle, of the Larigard lighthouse, reports, "A skylark, followed by a string of bees. The plaintive cries of this poor bird first attracted my attention; it flew so close that I almost caught it; it was closely pursued by a large number of bees, and in its fright took to the water, followed by its pursuers. When last seen it was making for the Essex coast." July 31st, at 10.14 a.m., "A cloud of mosquitoes pitched in this neighbourhood, similar to those seen in India; most of them were carried off at noon by a light breeze." Mr. Chas. Williams, of the Hanois lighthouse, Guernsey, says, under date of July 10th:—"A great quantity of large ants, with wings, passing; a great many settled on the rocks and about the lighthouse. I have only once seen them before like this, when I was stationed at the South Bishop Rock, off the coast of Wales." Heligoland, by Mr. Gätke:—"Night, July 2nd to 3rd, thousands of *Plusia gamma*; 3rd, myriads of dragonflies; night, 21st to 22nd, great numbers of *Bombyx neustria*, east to west; 22nd to 23rd, the same; 27th to 28th, numerous flights passing on."—From the '*Report on the Migration of Birds, 1884*'; communicated by JOHN CORDEAUX, Secretary to Committee.

ABUNDANCE OF APHIDES AT PETERBOROUGH.—On Thursday the central streets of the town were rendered impassable with any amount of comfort, owing to the air being thickly laden with myriads of green flies, in some parts almost resembling a mist. The town air seemed in the long-run to upset them, for they were late in the day to be seen covering the ground to nearly an inch in depth. The Corn Exchange had just been repainted, and acted as an admirable flycatcher, causing some amount of

amusement to all except the contractor, who was compelled to pumice-stone their corpses off to make the place presentable.—*'Stamford and Rutland Guardian,'* August 14, 1885.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—An ordinary meeting was held at the Society's rooms, 1, Denman Street, Southwark, S.E., September 3rd, 1885, the President, Mr. R. South, in the chair.

Mr. J. Jenner Weir exhibited some very interesting specimens from the Kalahari Desert, South Africa, captured there by Mr. Farini, *viz.*, species of Arachnida, Orthoptera, the curious toad-grasshopper, *Batrachotettix bufo*, also a species of *Mantis*, and a piece of a sand-hill, containing some of the white ants by which it was formed. Mr. Weir briefly referred to the peculiarities of habit and structure of the insects exhibited.

Mr. Janson, who was present as a visitor, exhibited a specimen of *Sphinx convolvuli*, taken on the knocker of a door in Victoria Road, Finsbury Park; and Mr. Gurney, also a visitor, a fine variety of *Chelonia caia*, in which the spots of the hind wings unite and form a band.

Mr. South exhibited some curious varieties of *Zygæna filipendulæ*, *Chelonia caia*, *Abraxas grossulariata*, and *Lycæna icarus (alexis)* var. *icarinus*; and communicated some interesting notes on the Lepidoptera of Folkestone.

Mr. Billups read a short paper on Homoptera, which he illustrated with numerous specimens; the same gentleman also brought insects in the orders Coleoptera, Orthoptera, Diptera, and Hymenoptera.

Mr. Adkin (Vice-President) exhibited a fine series of *Dicranura furcula* and *Pseudoterpna pruinata (cytisaria)*, bred, and *Acidalia inornata*. Mr. Chaney showed a box of Coleoptera, and Mr. Cook a box of Lepidoptera.

Mr. Hall exhibited a striking variety of *Abraxas grossulariata*, the only variety bred from 380 larvæ, some 180 of which were ichneumonised. Mr. Helps brought larvæ of *Lophopteryx camelina*, Mr. Hickling a strongly-marked specimen of *Argynnis aglaia*, and Mr. W. A. Pearce a box of Lepidoptera.

Mr. Wellman exhibited a fine series of *Eupithecia rectangulata* var. *nigrosericeata*, and specimens of *Psamotis pulveralis*, *Acidalia strigilaria*, and *Gnophos obscuraria* var. *calceata*. Mr. J. T. Williams exhibited *Sphinx convolvuli*, a series of bred *Plusia chryson*

(*orichalcea*), *Oxyptilus distans*, and *Mimæseoptilus plagiodactylus*.
—WALTER A. PEARCE; Hon. Sec., Lyndhurst, Croxted Road,
West Dulwich.

REVIEW.

*The Transactions of the Entomological Society of London for the
Year 1884.*

THE Transactions for the past year fully sustain the reputation which this Society has attained amongst the learned societies of the world. The volume for 1884 contains twenty-five memoirs; of these eleven relate to Lepidoptera (one of which is partly on Hymenoptera), three to Coleoptera, five to Hymenoptera, one to Hemiptera, three to Diptera, one on the caprification of figs, and one on the *Pediculus melittæ* of Kirby, and its affinities, with reference to the larvæ of *Meloë*.

The Transactions extend to 517 pages; and the Proceedings, including the able address of the retiring President, Mr. Dunning, to 45 pages. They are illustrated by fifteen plates.

Of the papers relating to Lepidoptera, Mr. Elwes deals in an admirable manner with that widely distributed and most difficult genus *Colias*.

Mr. Poulton's "Notes upon, or suggested by, the colours, markings, and protective attitudes of certain lepidopterous larvæ and pupæ, and of a phytophagous hymenopterous larva," form a very welcome contribution to philosophical natural history. They are illustrated by a beautiful coloured plate.

Mr. Meyrick's two memoirs on the classification of Australian *Pyrallidina* are excellent. The author has also had the advantage of observing the species in their native localities.

Lord Walsingham contributes a most valuable memoir on North American Tortricidæ, illustrated by an accurate coloured plate of sixteen species.

Mr. Forsayeth's memoir on the "Life-history of sixty species of Indian Lepidoptera," illustrated by a coloured plate, contains the result of long and patient observation, and will be read with interest by all entomologists.

There are other memoirs on Lepidoptera of great merit by Messrs. Miskin, Lionel de Nicéville, Butler, and Moore.

The papers on Coleoptera are two by Mr. David Sharp, in his usual painstaking manner, on "The water-beetles of Japan," and a "Revision of the Hydrophilidæ of New Zealand"; and one by Mr. Sidney Olliff, on the life-history of a *Cassida* from Brazil.

The most important of the memoirs relating to Hymenoptera is that by the Treasurer, Mr. Edward Saunders, forming the third part of the "Synopsis of British Hymenoptera-aculeata, *Apidæ*." It is needless to say that this is written with the usual acumen of that careful author. Mr. E. Saunders contributes also "Further notes on the terminal segments of Aculeate Hymenoptera"; Mr. Bridgman, "Further additions to Mr. Marshall's Catalogue of British Ichneumonidæ"; Mr. Hockings, "On two Australian species of *Trigona*"; and Mr. Cameron, "Descriptions of new species of Tenthredinidæ and Cynipidæ from Mexico."

Mr. Douglas contributes the only memoir relating to Hemiptera, "On a new species of the genus *Orthezia*." This is written in the careful manner characteristic of the author, whose habits of close observation are so widely known; and is illustrated by a plate showing these minute insects magnified.

Mr. Kirby contributes some "Notes on the Diptera of New Zealand"; and Baron Osten-Sacken, "Facts concerning the importation or non-importation of Diptera into distant countries." This paper is of great interest. The Baron also contributes a very philosophical memoir on comparative Chætotaxy, or the arrangement of characteristic bristles of Diptera.

Lastly, there are those two remarkable memoirs, read by Sir Sidney Saunders, on the "Caprification of Figs" and "On the *Pediculus melittæ* of Kirby, and its affinities, with reference to the larvæ of *Meloë*." The latter, as stated by the President in his address, was an "abstruse and closely-reasoned communication," read by one of the original members of the Society in the seventy-fifth year of his age, and within less than a fortnight of his death.

The President concluded his notice of the late Sir Sidney Saunders with the following remarks, in which all who had the pleasure to know him will concur:—

"Thus from 1834 to 1884 Sir Sidney Saunders was a contributor to our Transactions, and all his important memoirs have appeared in the Society's publications. It has been truly said that his published writings were far too few to represent his extensive knowledge of our science.

I cannot doubt, however, that many of his memoirs, *e.g.*, those on the Stylopidae or bee-parasites, on the brier-insects, the fig-insects, and other Hymenoptera, will have an enduring value and preserve him from oblivion. His carefulness and accuracy in observation and research, his kindly encouragement of those who needed it, and his unfailing courtesy to all, combined to constitute a man with whom it was a pleasure to be associated; and to us at least, who have known him personally, and been allied with him as Members of this Society, the memory of our late colleague will continue ever green."

The Proceedings are replete with valuable short communications, too numerous to be dealt with here. Amongst them is one that should not be passed over, *viz.*, Miss Ormerod's communication on the warble-fly, *Hypoderma bovis*, so destructive to the hides of bullocks. Prof. C. V. Riley, who was present at the discussion of the subject, stated that the larvæ might be destroyed by the application of kerosine or mercurial ointment to the backs of the cattle attacked.

At so important a period in the history of the Entomological Society, it may be desirable to give a very brief account of its origin and progress.

In pursuance of Resolutions adopted at a preliminary meeting, held on 3rd May, 1833, at which were present N. A. Vigors, Esq., M.P., J. G. Children, J. E. Gray, G. R. Gray, J. F. Stephens, and W. Yarrell, Esqrs., Revs. F. W. Hope and G. T. Rudd, and Dr. Horsfield, the organisation of the Entomological Society was effected; and the first general meeting was held at the Thatched House Tavern, St. James's Street, on 22nd May, 1833, J. F. Stephens, Esq., in the chair, when the Council and Officers were elected and appointed, as follows:—Honorary President—Rev. William Kirby, M.A. President—J. G. Children, Esq., Sec. R.S. Vice-Presidents—N. A. Vigors, Esq., M.P., D.C.L., F.R.S., Dr. Horsfield, F.R.S., J. F. Stephens, Esq., F.L.S. Treasurer (and Vice-President)—Rev. F. W. Hope, M.A., F.L.S., &c. Secretary—G. R. Gray, Esq. Curator—G. R. Waterhouse, Esq. The other members of the Council were—A. H. Davies, Esq., F.L.S., &c., J. E. Gray, Esq., F.R.S., &c., A. W. Griesbach, Esq., B.A., E. Newman, Esq., F.L.S., &c., Lieut.-Col. Sykes, F.L.S., &c., W. Yarrell, Esq., F.L.S., &c.

On 4th November, 1833, W. Spence, Esq., F.R.S., was elected an Honorary English member; and W. B. Spence, Esq.,

was appointed Foreign Secretary to the Society. The late Dr. Charles Darwin was one of the original members of the Society, which was supported also by most of the eminent naturalists of the day. At the meeting held 1st June, 1835, the President announced that their Royal Highnesses the Duchess of Kent and the Princess Victoria had been graciously pleased to become the Patronesses of the Society; and a letter from Sir John Conroy was read to that effect. It will, therefore, be seen that when Her Gracious Majesty granted a Royal Charter to the Society on 20th July last, it was not the first time that Her Majesty had been pleased to recognise the laudable design of the Entomological Society.

The first volume of the Society's Transactions was published in 1836, and to the the year 1884 inclusive thirty-two volumes have been published, all of which contain most valuable contributions to Science.

The meetings of the Society have been well attended, and have formed a medium of personal intercommunication between not only the entomologists of Great Britain and the Colonies, but also of foreign countries; and many warm friendships between scientific men have been so brought about. Those whose knowledge of the Society's meetings extends over several decades treasure up in kindly remembrance the conversations they have had with the eminent naturalists they have met there, now no longer living; but happily what may be said of the past, can equally be said of the present, members of the Society,—so many willing and able at all times to assist in the kindest manner the neophyte, and to impart to all the knowledge that they possess; and of whom it may be truly said, "*Olim meminisse juvabit.*"

It is very much to be hoped that the entomologists of the whole United Kingdom and the Colonies will join the Society, which has now become a National Institution; and thus enable the Council to increase the size and importance of the annual volume of Transactions.

The annual subscription is much less than that of most of the learned Societies, and the Fellows have the additional advantage of purchasing the earlier publications of the Society at a reduced rate.



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CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI*.

BY RICHARD SOUTH, F.E.S.

(Continued from vol. xvi., p. 77.)

MIMÆSEOPTILUS, Wallengren.

plagiodactylus, Sta.

(PLATE I., FIGS. 1 & 2.)

IMAGO. — Expanse, 9–10 lines. Fore wing gray-brown; some black scales along the costal margin, inner margin ochreous-brown. At the digital juncture is a black spot of irregular shape, and between this and the base of the wing is a black dot. Towards the apex of the outer digit is a small blackish linear spot or dash. All these markings are inconstant as regards size and intensity; especially is this the case with the digital spot, which in some examples is only very faintly indicated, and in others stands out prominently. Fringes brown, paler round the inner edge of the outer digit. The bases of the digital fringes are whitish, with a series of small patches of black scales arranged in the following order:—One at angle and one at tip of outer digit, one at angle of inner digit, and two between this and tip of inner digit. Tip of outer digit subacute, that of inner obtuse. Hind wing and fringes slightly darker than fore wing. Head and two-thirds of thorax (prothorax and mesothorax) gray-brown, remainder of thorax (metathorax) and abdominal juncture pale ochreous-brown; abdomen gray-brown. Legs gray-brown. May and June.

LARVA. — Length, 4–4½ lines, attenuated posteriorly. Head smaller than 2nd segment, pale shining yellowish green, freckled with brownish; mandibles pale brown; a black spot on each cheek. Ground colour obscure green; segmental divisions yellowish green. Dorsal stripe reddish pink, or rose-madder, most distinct on the 9th to 12th segments, and indicated only

by narrow dashes on the anterior portions of 3rd to 8th segments. Two or more black spots on 2nd segment. Subdorsal line darkish green; this is of variable width, sometimes assuming the proportions of a stripe and invading the spiracular area. There are no perceptible tubercles, but the whole body is thickly covered with hooked bristles, some of which appear dark coloured, others whitish; there are also some longer whitish hairs, singly along the dorsal area, but in pairs laterally. Spiracles black. Prolegs and anal claspers shining pale green, with a pale brownish tinge. Food, *Scabiosa succisa* and *S. columbaria*. First brood eat the tender inner leaves of the main shoots. April and May (sometimes in June).

PUPA.—Pale green, with an obscure reddish pink dorsal line or stripe, which in some examples is only represented by short dashes behind the thorax and on the last four segments. The anal segment and tip of leg-cases pale pinkish; sometimes the whole of the dorsal area is also suffused with pinkish. Wing-cases tinged with yellowish. Leg-cases detached from abdomen. Suspended by anal attachment from a leaf or stem of food-plant. April, May, and June.

Plate I., fig. 2, *Mimæseoptilus plagiodactylus*; 2 a, larva enlarged; 2 b, pupa enlarged; 2 c, devil's-bit scabious (*Scabiosa succisa*).

I am obliged to Mr. W. Purdey, of Folkestone, for sending me larvæ of this species.

The foregoing descriptions only apply to the various stages of the first brood. The larva of the second brood feeds in the flowers of *Scabiosa* in July (perhaps also in June); and the imago appears in July and August (sometimes even later).

Mr. Trimmer Williams exhibited, at a meeting of the South London Entomological and Natural History Society, a series of a *Mimæseoptilus*, which he said he had bred from larvæ found feeding in the flowers of *Scabiosa*. These insects I identified as *M. plagiodactylus*. I bred this species from a larva swept off certain flowers, among which was *Scabiosa*, in July, 1882. A description of this larva will be found on page 99 of this volume, but I do not consider it quite trustworthy, because at the time I took it down I was standing under a glaring sun, and the subject under observation was very restless.

In Wales Mr. Gregson finds a *Mimæseoptilus* larva feeding on *Scabiosa columbaria*. These Mr. Gregson says, in his note (*ante*, p. 150), are to be found in March and April; and the imago is on the wing in June and July. One or two larvæ, kindly sent me by this gentleman in 1881 during May, continued feeding until the 23rd of that month, and pupated on the 27th. In 1882

Mr. Gregson was again good enough to send me three full-fed larvæ on the 17th of May; and this year I received a few from him on 4th June. In the note which accompanied the last lot of larvæ, Mr. Gregson says, "The season was very late in Wales, or these should have been now appearing." Probably, therefore, as June is abnormally late, March may also be exceptionally early, and April and May are the months during which the larvæ feeding on *Scabiosa columbaria* are usually found. In this respect, then, they agree with larvæ of *Mimæseoptilus plagiodactylus*.

In some of the Welsh larvæ the dorsal area is unadorned with red of any shade, until within a short time of pupation, when the anal segment becomes slightly rosy. This was the case with larvæ received from Mr. Gregson this year (*ante*, p. 195). In every other particular they agreed with the description taken down of the larvæ sent me by this gentleman in 1881 and 1882, as they also did with larvæ received from Purdey. The moths bred from the 1881 larvæ were small strongly-marked *M. plagiodactylus*, as were also the imagines from the 1882 larvæ. Those bred this year are larger, and one or two less-strongly marked, differing not at all from the Folkestone insects.

Seeing that the characteristic markings of the larva, pupa, and imago of *M. plagiodactylus* are subject to variation, it does not appear to me matter for surprise that in some isolated localities those markings should in one stage of the insect be reduced to vanishing point or entirely absent, and in another greatly intensified. Such variation, if constant, which in this case it is not, constitutes a local form; but whilst the connecting links exist it cannot establish a species.

The strongest marked imago of *M. plagiodactylus* I have bred from larvæ received from Mr. Gregson is figured on the plate, together with figures of larva and pupa; these last were taken from examples sent in 1881. Plate I., fig. 1, imago; 1 *a*, larva feeding; 1 *b*, larva enlarged; 1 *c*, pupa enlarged; 1 *d*, food-plant (*Scabiosa columbaria*).

CNÆMIDOPHORUS, Wallgr.

rhododactylus, Fb.

(PLATE I., FIG. 3.)

IMAGO. — Expanse, 9–11 lines. Fore wing warm sienna-brown, some whitish scales at the base and along the costal margin. On the inner

margin is an interrupted whitish streak. This commences near the base, and is broken by the ground colour just before the middle; from this point some whitish scales on the disk of the wing form a connection with a large whitish blotch on the middle of the costa; beyond the middle a narrow whitish band runs from the costa to inner margin, parallel with the hind margin; the inner edge of this band is broadly margined with a darker shade of the ground colour. Fringes whitish, dark brown at the base, and variegated with brown at the tips, angles, and inner margins of both digits; tip of outer digit acute, inner obtuse. Hind wing, first and second feathers lustrous golden brown; third feather much shorter than the other two, dark brown, broadly whitish along its inner margin; fringes lustrous golden brown, with some whitish scales at the tip. Head, thorax, and abdomen colour of fore wing, the latter variegated with whitish; abdominal juncture whitish. Legs white, variegated at the joints with brown; spines white. July.

LARVA.—Length, 5–6 lines, slightly attenuated posteriorly, and from the 5th to 2nd segment anteriorly. Head dingy ochreous, tinged with green and freckled with pale brown; the crown spotted with dark brown; mandibles pale reddish brown, tipped with darker; a large black spot on each cheek. Ground colour yellowish green; dorsal line reddish violet, most distinct on the 2nd to 6th segments, and again on the 11th to 13th segments. Tubercles, four rows (four on each segment) of small whitish warts, each emitting a single whitish hair; subdorsal, one on each segment, with a whitish hair; spiracular, one on each segment, from which spring two diverging whitish hairs. Spiracles reddish brown, with whitish outer margins. Prolegs blackish; anal claspers semitransparent, greenish, tipped with brown. The whole body is thickly studded with short whitish bristles. Food, *Rosa*. It usually bores a hole through the upper portion of a flower-bud, and feeds on the folded petals. This habit is shown on the plate, fig. 3 *a*. Sometimes the larva may be found feeding on the stamens of a flower, the petals of which are fastened together by their outer edges with silken threads. When feeding on flower-buds the larva conceals itself by drawing down and securing a leaf to the bud. June.

PUPA.—Dingy green, with a darker dorsal line, strongly suffused with rose-colour or violet. Hairs as in the larva. The paler wing-cases stand out prominently from the thorax, thus giving the pupa a swollen appearance at this point. Attached by the anal segment to the flower-stem just below the ovary, and protected by a slight network of silk, which unites a leaf with the flower-bud. The pupa stands erect, and in this position bears a superficial resemblance to a stunted rose-bud.

Plate I., fig. 3, *Cnæmidophorus rhododactylus*; 3 *a*, larva feeding; 3 *b*, larva enlarged; 3 *c*, pupa in position; 3 *d*, pupa enlarged; 3 *e*, dog-rose (*Rosa canina*).

I was this year fortunate enough to find five larvæ of this species in one of its old localities, and felt exceedingly glad to renew its acquaintance after a lapse of seven years.

PTEROPHORUS, Wallgr.

monodactylus, L.

pterodactyla, Hb. (us), D. L.

(PLATE I., FIG. 4.)

IMAGO.—Expanse, 10–12 lines. Fore wing whitish or grayish brown, in some examples pale ochreous brown; a small irregular shaped black spot at digital juncture, and a black dot between this and the base of the wing. Fringes gray-brown, with two brown dots in the apical margin of outer digit, and three black dots on the margin of inner digit (one at the tip, one at the angle, and one midway between these two). Hind wing and long silky fringes gray-brown. Head and thorax colour of fore wing. Abdomen gray-brown, with a whitish median stripe intersected by a blackish line; this latter swells out into somewhat lozenge-shaped spots at the segmental divisions. Legs gray-brown. July to April; most frequently met with in September.

LARVA.—Length, 6–7 lines, tapering posteriorly. Head much smaller than 2nd segment, pale brown, sometimes with a greenish tinge; mandibles brown, a black spot on each cheek. Ground colour dingy green, streaked and dotted with whitish, and somewhat suffused with red-brown. Dorsal stripe is dilated on the crest of each segment, forming a series of lozenge-shaped marks, either dark green or red-brown. Tubercles, two dorsal rows (four on each segment), but little paler than the ground colour, with tufts of whitish or pale brown hairs; subdorsal, one on each segment, also with a tuft of whitish or pale brown hairs; spiracular, one large transparent tubercle, with tuft of whitish or pale brown hairs on each segment, and a smaller one on the posterior edge of the 4th to 11th segments; these last have short whitish or pale brown bristles. Prolegs and anal claspers pale brown, tinged with greenish. Food, various species of *Convolvulus*; eats flowers, buds, and leaves. June to September.

PUPA.—Green at first, afterwards pale dingy brown, more or less suffused with reddish brown along the dorsal area. Dorsal and lateral lines interrupted, blackish brown; warts and hairs as in the larva, except that some of the dorsal series are blackish. Head flattened, marked with brown, and thickly covered with short hairs. Wing-cases yellowish green, faintly streaked with brown. Attached by anal segment to stem of food-plant or other object near. June to September.

Plate I., fig. 4, *Pterophorus monodactylus*; 4 a, larva feeding; 4 b, larva enlarged; 4 c, pupa enlarged; 4 d, *Convolvulus*.

Mr. G. C. Bignell, of Stonehouse, was kind enough to send me larvæ of this species on June 17th this year. Some of them were nearly full grown, others quite small. He found them in a garden feeding on the small garden convolvulus (*Convolvulus minor*). When the supply of food sent with them was exhausted, shoots of the large convolvulus (*Convolvulus major*) were given them, which they took to readily, as also they did afterwards to the small bindweed (*Convolvulus arvensis**). The larvæ pupated between June 26th and July 5th, and the moths appeared between the 6th and 30th of July.

I have frequently taken this "plume" in the autumn, and also in the spring. It may frequently be observed sitting on garden walls and palings. In this position its resemblance to a T-shaped bit of hay or straw is very curious. When at rest the hind pair of legs are laid along the body, the feet meeting at the end of the abdomen and resting thereon. The hind wings are folded up under the fore wings, and the inner digits of the fore wings are folded or rolled up under the outer digits, so that the fore wings are reduced to nearly half their width.

In the autumn of 1876 I observed *P. monodactylus* flying at dusk in some numbers around and about a clump of large bindweed (*Convolvulus sepium*). An examination of the plant next day resulted in the finding of several pupæ and larvæ.†

Until the present year, with the exception of hibernated specimens in the spring, I had not seen this species on the wing before the month of September. This year I netted one example at Folkestone on August 7th, and on the 29th I boxed two others from off a garden fence at Hampstead.

Hitherto *P. monodactylus* has been considered single-brooded, occurring in the larval stage in August and September, and in the perfect state in September and October, and again after hibernation in the spring. It appears, however, that there are two broods of the species in the year, although there does not seem to be any clear interval between the broods. Late imagines of the first brood may be contemporary with early imagines,

* In a recent note Mr. Bignell tells me that this plant also grew in the garden where he found the larvæ.

† This is not peculiar to *P. monodactylus*. Many of the Pterophoridae are to be found as larva, pupa, and imago at one and the same time, and often on the same plant.—R. S.

certainly with larvæ, of the second brood. For this reason it would perhaps be more correct to say that there are a succession of broods between June and October. From my own observation I am inclined to think that there are but two broods, and that the periods may be approximately fixed as follows:—First brood, larva, June and July; imago, July and August. Second brood, larva, August and September; imago, September and October.

Lord Walsingham, in his 'Pterophoridæ of California and Oregon,' writing of *Pterophorus monodactylus* (p. 40), says:—"One distinguishing peculiarity of this genus and species, whether in Europe or in America, by which it may always be immediately recognised, is the presence of brush-like tufts of appressed scales on the upper side of the hind feet. In good specimens these are noticeable on each of the tarsal joints below the second pair of spurs; it is remarkably constant, and does not occur, so far as I am aware, in any other genus of the Pterophoridæ."

PLATYPTILIA, Hb.

bertrami, Röessler.

IMAGO.—Expanse, 12–14 lines. Fore wing whitish ochreous, more or less suffused with a pale shade of raw sienna, and clouded with a darker shade of the same colour. The costa narrowly dotted with dark brown scales: beyond the middle these scales become more numerous, and form a distinct dark brown costal edging to the outer digit; this edging is interrupted just over the digital juncture by the whitish ochreous ground colour, which shows up in the costa at this point. Just below the digital juncture are some dark brown scales; in some examples these scales are so compacted as to form a distinct dot. Fringes, a paler shade of ground colour, with a patch of brownish scales at the angle of inner digit, and a smaller patch about the middle of the inner margin also brownish. Tip of outer digit, in some specimens produced and hooked, in others it is not produced and hardly pointed; tip of inner digit obtuse. Hind wing, first and second feathers brown, with a faint purple gloss; fringes paler. Shaft of third feather pale brown; fringe grayish brown, whitish ochreous at the base, with a small, apparently round, patch of dark brown scales in the middle of inner margin.* Head, thorax, and abdominal juncture whitish ochreous, more or less suffused with raw sienna. Hind legs whitish, with three brown bands; one large and one small one on the tibiæ, and a small one on the tarsi. The tarsal markings are only seen in fresh specimens. July.

* This patch also occurs in *dichrodactylus*, but reference to it was omitted in my description of that insect (Ent. m. xv. 146).—R. S.

As will be seen, on comparing the above description of the imago with that of *dichrodactylus* (Entom. xv. 146), there is no material difference between the two, except as regards the tone of colour.

In his differential note on *Platyptilia dichrodactylus* and *bertrami*, Mr. Sang says of *dichrodactylus* (E. M. M. xviii. 144):—"The imago fades—especially out of doors—sooner than any other I have any experience of; for I never took an example at large that was not more or less bleached: generally, they are almost white. . . . My only captures of *bertrami* have been at Witherslack, where it seems pretty abundant. Now, I never took a faded one; they were all well coloured: so one would fancy that if they were identical, the food-plant must have caused a very complete alteration in the qualities of the colouring-matter of the scales."

I have not had the pleasure of taking the tansy-feeding insect; but as regards the yarrow-feeder, that is *bertrami*, I have been less fortunate than Mr. Sang, for a large proportion of the specimens I have met with were decidedly bleached, though not really worn. In the series now before me there are only seven well-coloured specimens; in the others the colour becomes fainter and fainter, until it finally vanishes almost entirely in the last two examples, which are nearly white, that is they possess but the least possible trace of their pristine coloration.

Mr. James Hinchcliffe, of Tillicoultry, was good enough to send me larvæ of this plume on the 24th of June last. One of these, during transit through the post, unfortunately managed to escape from the box; and on opening the parcel it was found flattened between an enclosed note and the top of the box. The others, three in number, were found separately in shoots of yarrow. Two of these appeared to be only half-grown when removed from their respective mines; but the third was nearly or quite full-grown. On comparing this larva with my description of the larva of *dichrodactylus*, as given in the 'Entomologist' (xv. 146), I was unable to find any important points of difference. Except that the prolegs and anal claspers of the yarrow-feeding larva were tipped with black instead of brown, the description of the tansy-feeder exactly applied. The position, appearance, and hirsute adornment of the tubercles were identical. In due course this larva pupated, and the pupa exactly agreed with my

description of the pupa of *dichrodactylus*. On the 21st of July the moth made its appearance, and as it differs from all my captured examples I give a short description:—Expanse, 12 lines. So much suffused with an umber tint as to appear almost entirely of this colour; but the whitish ground colour shows itself along the inner margin, and again in a narrow ill-defined stripe from the costa to the digital juncture. The scales at digital juncture are hardly darker. All three feathers of the hind wings, including the fringes, are lustrous umber-brown, and there is no trace of darker scales along the inner margin of third feather. The tibiæ of hind legs are whitish to their middle, then brownish to the tarsi. The tarsi are whitish, and have three narrow brownish rings.

The apparently half-grown larvæ differed from the one specially examined in the coloration of the dorsal and subdorsal stripes. These stripes were of a colour rather difficult to express in words, but somewhat approached purple-brown. Neither of these larvæ, however, were destined to attain the perfect state. One of them eventually proved to be ichneumoned; and the other, from some obscure cause, failed to thrive, and died a few days after I received it.

Is Rössler's *bertrami* specifically distinct from the *dichrodactylus* of Mühlig? And if so, what are the differential characters? Compared with *bertrami*, *dichrodactylus* is said to present the following points of distinction:—

First.—“The palpi are decidedly longer” (Sang, E. M. M. xviii. 144). I have carefully examined the palpi of both insects, and quite fail to see that there is any perceptible difference in their respective lengths.

Secondly.—The tip of outer digit is rendered more acute by the deeper concavity of the hind margin of that digit (Id.). As has been adverted to in the description of *bertrami*, the tip of the outer digit is variable as regards its structure; in some specimens the hind margin of the outer digit is strongly emarginate, and the tip is in consequence produced and very acute.

Thirdly.—“The tibiæ are brown at the middle and apex, and there is a brown spot at the end of the first tarsal joint” (Stainton, E. M. M. ii. 138). Identical markings exist on the hind legs of fresh examples of *bertrami*.

Fourthly.—Larva feeds in “July, and the moth appears in
ENTOM.—NOV., 1885.

August" (Id.). Mr. Stainton says (E. M. M. ii. 137), "I have only a single bred specimen of *dichrodactylus*; this was bred from a pupa on tansy at Chudleigh, in June, 1850, and which appeared in the perfect state July 5th." The late Mr. Buckler bred this insect from June 28th to July 5th from larvæ received from Mr. Sang, June 8th (cf. E. M. M. xii. 233). The larvæ sent me by Mr. Sang in 1882 were feeding in June, and the moths emerged in July. Then as regards *bertrami* I have bred it, as stated above, in July, from June larvæ; and Mr. Porritt bred his first specimen on July 24th, from larvæ received June 25th (cf. E. M. M. xxii. 105). In a state of nature I have met with this insect from the end of June to the end of July.

From these facts it does not appear that *dichrodactylus* is a later insect than *bertrami*; but, on the contrary, they tend to prove that the two insects are synchronous.

In all reference to the tansy-feeding insect I have used Mühlig's name, *dichrodactylus*, to save confusion; but it should be remembered that the prior name is *ochrodactyla* of Hübner; and if it is ultimately conclusively proved that *bertrami* is not distinct, then Rössler's name also will be sunk, and the synonymy will stand thus:—

OCHRODACTYLA, Hübner.

dichrodactylus, Mühlig.

bertrami, Rössler.

Lord Walsingham, in his remarks on *P. bertrami* ('Pterophoridæ of California and Oregon,' p. 4), observes that the late Professor Zeller was inclined to consider *bertrami*, *ochrodactyla* (= *dichrodactylus*), and *bischoffii* as all belonging to the same species. The last named is a Texan insect, and I have not seen it; but as regards *bertrami* and *ochrodactylus* I quite concur in the opinion entertained by the late Professor.

12, Abbey Gardens, London, N.W., Oct. 14, 1885.

RHOPALOCERA IN THE NEW FOREST.

BY F. W. HAWES.

ON July 18th, in company with my brother, in pursuit of improved health and entomological specimens, I started for Lympington, which we found a convenient place for working the

New Forest and Isle of Wight. When I say that within six miles on either side of this town, we saw and could have captured thirty-three species of the Diurni during the three weeks from July 18th to August 8th, it will be seen that to a beginner the locality affords abundant opportunity for increasing his acquaintance with, and captures of, several of the much-wished-for species in the list. A detailed list of what may seem at first sight a large percentage of our Rhopalocera may not be uninteresting.

The three common species of the Pieridæ, viz., *Pieris brassicæ*, *P. rapi*, and *P. napi*, were of course plentiful in most parts of the neighbourhood; of the two former some specimens noticed were particularly large, while of the latter some were decidedly under the usual expanse of wing. *Gonepteryx rhamni* was common after July 25th in the Forest, more especially about Stubby Copse, but noticeably absent from the lanes; while among the Nymphalidæ no less than ten species were on the wing. Four of the genus *Argynnis* were visible; *A. paphia* was common in nearly all the enclosures, and in some really abundant, especially in Ramnor, Stubby Copse, and Park Hill. This insect was well out, although not worn, by July 20th; and on the 23rd my brother captured a confluent variety of the male at Park Hill, and at the same time and place a freshly emerged specimen of the variety *valezina in copulâ* with a typical male. Of this variety (*valezina*) we afterwards saw a dozen or more, nearly all about Stubby Copse; but although we took three they were much worn. Of *A. adippe* a few were seen and six captured in the more open parts of the enclosures, flying over and settling on common brake-fern; and of *A. aglaia* only two were seen,—one a fresh female in Ramnor Enclosure, and another in a lane between Sowley Pond and Beaulieu. Of *A. selene* two were seen as late as July 25th; of course much worn. Of the genus *Vanessa* five species were present. The larvæ and imagines of *V. urticæ* were seen in nearly all the lanes about Lyminster; and one *V. polychloros* in Ramnor Enclosure on July 27th, and a pupa found under a gate-post in Lyminster the same evening, from which the imago emerged four days later. Both larvæ and imagines of *V. io* were very common all over the district, forming a pleasant contrast to its apparent scarcity in the neighbourhood of London; also larvæ and imagines of *V. cardui*, especially in Stubby Copse; and in the lanes the larva of *V. atalanta* was also common. *Limenitis sibylla*

was common ; and in some enclosures, as Ramnor, Stubby Copse, and Park Hill, abundant. By 20th July the males were much worn, but the females were seen up to August 6th in good condition.

Apatura iris.—Of this fine insect we saw in all a dozen, mostly females. I was fortunate in capturing a pair in Stubby Copse, the male settling on bare ground a yard or two in front of us ; the female flying low, enabling us to surprise and net it. Two others (females) flying low were unfortunately missed, tending to show, I think, that in large areas where *A. iris* is found its descents are more frequent than is generally supposed.

The Satyridæ were well represented ; in all, eight species. *Melanargia galatea*, not seen in the Forest proper, but two or three on Lymington Heath, several in lanes between Sowley Pond and Beaulieu, single specimens here and there about Freshwater, and common between Yar Bridge and Cliffe Battery, near Yarmouth. Specimens of the second brood of *Pararge egeria* were common about Stubby Copse after July 31st ; while that of *P. megæra* was just appearing on August 1st in lanes near Lymington. We found *Satyrus semele* scattered over the whole district, being common on Lymington Heath, where it had a curious habit of settling on fir trunks, apparently in the interests of self-protection ; it occurred also on the heaths about Matley Bog, Hordle, and Beaulieu, and occasionally in the enclosures. Of *Epinephele ianira*, all that is necessary to say is that it was ubiquitous, except that we caught six of the bleached variety, five of which were males. The males would, therefore, appear to be more liable to variation than the females. *E. tithonus* was the most abundant species seen during our stay, some of the females being exceptionally large. In the lanes near the coast they were flitting in countless numbers over the brambles, but no varieties came under our notice ; and *E. hyperanthus* was abundant in all the Forest enclosures, and common in many of the lanes. *Cænonympha pamphilus* was common everywhere on waste ground.

Among the Lycænidæ we counted six species, among the most common being *Lycæna ægon* on the heaths, Matley, Lymington, near Hordle, and outside Ramnor Enclosure being the places in which we noticed it mostly. *Thecla quercus* was the only "hairstreak" noticed. In the enclosures it frequently came

down to the brake-ferns with a swift zigzag flight. *Polyommatus phlæas* was seen here and there in lanes, and commonly on the cliffs at Freshwater. The second brood of *L. icarus (alexis)* was out commonly by August 6th in most waste places; and *L. corydon* in the lanes and on the downs near Freshwater, on July 30th. A few of the second brood of *L. argiolus* were seen near Beaulieu, flying over holly bushes; making in all a good family show.

Of the Hesperidæ the two common species were on the wing, a few *Hesperia sylvanus* being seen in the enclosures and in lanes; while *H. linea* was common on marsh-land near the coast, in the Forest, and in many lanes.

As we did nothing beyond day collecting, the number of night-flying species was limited. Besides many commoner ones, we saw *Calligenia miniata*, *Lithosia mesomella*, *L. lurideola (complanula)*, *Euchelia jacobæ*, *Psilura monacha*, *Bombyx quercus*, among the Bombycidæ; *Metrocampa margaritata*, *Ellopiæ prosapiaria (fasciaria)*, *Pericallia syringaria*, *Boarmia repandata*, *Gnophos obscurata*, *Pseudoterpna pruinata (cytisaria)*, *Selidosema ericetaria (plumaria)*, *Eubolia limitata (mensuraria)*, of the Geometræ; *Bryophila perla*, *Tryphæna fimbria*, *Phytometra viridaria (ænea)*, of the Noctuæ; *Bombyx quercus* occurred in the Forest, and along the seashore near Hurst Castle; *P. pruinata (cytisaria)* common on all the heaths; while *B. perla* was to be found in some numbers on a red brick-wall just outside Lymington. Of *L. monacha*, a male pupa and a female imago were found on oak trunks in a fir wood on Lymington Heath. *S. ericetaria (plumaria)* occurred on heath, and we took five specimens (one a female). *T. fimbria* was occasionally seen on the wing in the enclosures; but of the others single specimens only were noticed. Larvæ we understood were backward; and, having our boxes well filled, the pleasure of larvæ-beating in the New Forest was deferred to another year. *Gortyna flavago* was common in thistle-stems on marsh-land near Lymington; and of the larva of *E. jacobæ*, which was abundant, quite 90 per cent. were the victims of a *Microgaster*.

From this short sketch it will be seen that a good field of observation may be found, without actually staying in the Forest itself; and that collecting may be largely varied according to the disposition of the collector. Of the thirty-three Diurni, thirty

(excluding *L. sinapis*, *L. argiolus*, and *L. agestis*) were seen during the first fortnight of our stay, viz., from July 18th to August 1st; and on August 7th, in a lane about a mile long, leading from Sowley Pond to Beaulieu, we saw no less than twenty-four species in the course of twenty minutes, and every one of these was a regular inhabitant; indeed we came across no casual visitors, *C. edusa* and *C. hyale* being conspicuously absent. In the Forest we could but notice the absence of collectors. Although we frequented the more generally known parts for nine of the available eighteen days, we only met three; and from some wood-fellers we had the information that there was more to be taken at night than during the day. However, as our day work proved sufficiently interesting and remunerative, we neglected the sugar and the lamp; and, all things considered, have every reason to be satisfied with our first visit to this interesting and pretty locality.

Dovecote Villas, Wood Green, N., Aug. 20, 1885.

ERICPELTIS FESTUCÆ, FONS., A SCALE INSECT NEW
TO THE BRITISH FAUNA.

By G. C. BIGNELL, F.E.S.

For several years I have been familiar with the sight of little objects looking like tiny tufts of white cotton-wool adhering to a grass (*Festuca bromoides*) in certain localities, but I did not investigate their nature till lately. Having become interested in *Microgasterides*, and so learning to know their little woolly cocoons, I thought of these little tufts on the grass, and in my experiment to find out if they contained ichneumons I discovered their real nature, namely, that they are the females of the above-named scale insect.

Through the autumn the female becomes more and more thickly clothed with this woolly envelope, and I am sure her appearance would at first deceive the keenest entomologist, and make him think he had an *Apanteles* cocoon before him, from its size, shape, and colour, and the way in which it is fixed on the grass. On further examination, however, with a lens he would begin to be puzzled with the number of short curly ends projecting from the mass, unlike the spun thread of any cocoon.

The male is a little two-winged fly, without any covering, but, curiously enough, having two long filamentous tails.

The pupa-scales of both sexes may be obtained about the middle of July, almost close to the roots of the food-plant, and can only be found by pulling the grass up by the roots; the scales are very small.

In order to give dates and localities, I will mention that Mr. J. Scott and myself, on the road leading to Whitsand Bay, July 22nd, after being several times deceived by a seed (I believe, a grass-seed) adhering to the *Festuca* and looking much like a scale, found two pupa-scales, which produced a male and female, the former emerging in two days' time whilst on its passage through the post to Mr. Douglas.

Again, on August 3rd, at Bickleigh, not far from the railway-station, on the road to Shaughbridge, we found several females covered with the woolly clothing, but not to such an extent as those found later in the season; they were also lower down the stems; later they come up higher, and are very conspicuous.

On October 19th I again visited the Whitsand Bay locality, which is reached from Plymouth by passing through Wiggall Farm-yard, and found many females; these on examination, by removing a part of the cottony covering, proved to be mere masses of eggs. I may add I have always found them on the north side of the hedge or fence.

Stonehouse, Devon, October 20, 1885.

NOTES FROM CORNWALL.

BY WILLIAM S. RIDING, B.A., M.D.

By a singular coincidence I again this autumn found a new locality in Cornwall for *Polia xanthomista*, var. *nigrocincta*. The Lizard district has many features in common with Morthoe, where I previously took this rarity (Entom. xvi. p. 248). It is an elevated plateau of extensive moorlands, covered with heather and scattered fields of cereals, some 200 to 300 feet above sea-level. A few clumps of trees, with here and there some others, mostly elms and poplars, isolated and weather-beaten, and a few wooded chines running down towards the sea, complete the landscape. The geological formation is igneous, chiefly serpentine and basalt, with clay-slate and talc-schists appearing in a few places. The coast scenery formed by these hard rocks, cut and

chiselled into all sorts of fantastic shapes and washed by the vast Atlantic rollers which foam and eddy amongst them, is one of extreme grandeur.

Insects at sugar were infrequent during the early part of September, the weather being wet and stormy. The usual common species, more or less worn, were only seen. Autumnal species and second broods did not appear till the middle of the month. On the 19th I took a recently-emerged male *Polia xanthomista*, at a field's length from the coast. It is rather smaller (1" 5'') than the Morthoe specimen (1" 7'') of this species. I cannot form any opinion of its abundance, as I left the Lizard on the 22nd, and, though sugaring on the 20th and 21st, both evenings were most unfavourable. *Armeria vulgaris* and *Plantago maritima* grow luxuriantly all about the coast. *Agrotis saucia*, *A. puta*, *Noctua glareosa*, *Anchocelis lunosa*, several varieties of *Luperina testacea*, &c., were plentiful; one of the latter variable species was much darker than any I have seen in the different collections. *Neuronia popularis* was abundant at light, and, amongst other insects, *Epione apiciaria*, *Cidaria testata*, *Anaitis plagiata*, *Macroglossa stellatarum*, and the commoner plumes, *Mimæseoptilus pterodactylus* and *M. bipunctidactylus*, were flying about freely. On sunny days the autumnal Diurni seemed everywhere, especially *Vanessa cardui* and the second broods of common blues. *Colias edusa* was frequently seen, but I did not notice *Colias hyale*, nor the variety *helice* of *edusa*.

Larvæ of the *Dianthæciæ* were feeding on the capsules of *Silene maritima* and *Lychnis vespertina*; those of *Bombyx rubi* and *Acronycta rumicis* on the heather, the former in unusual numbers; and of *Chærocampa elpenor* on *Galium verum*. The empty cases of the *Psychidæ*, *Fumea intermediella* (*roborecolella*) or *Epichnopteryx radiella*, were sprinkled over the rocks facing the cliffs and in the coves in several places.

I cannot say I worked the ground at all thoroughly from an entomological point of view—there was so much to interest in other ways; but, from the number of botanical rarities found there, such as *Trifolium strictum*, *T. bocconi*, *T. molinerii*, *Lotus hispidus*, *Erica vagans*, *Genista pilosa*, *Hypochæris maculata*, *Orobanche rubra*, *Vicia lutea*, &c., I should think the locality very likely to produce other uncommon species.

DESCRIPTION OF A NEW SPECIES OF *MYCALESIS*
FROM THE MALAY PENINSULA.

By W. L. DISTANT, F.E.S.

MYCALESIS USTULATA.

WINGS above bright rufous-brown; anterior wings with the apex and outer margin broadly infuscated, and with a moderately-sized dark fuscous ocellated spot—having a minute greyish centre and a pale rufous outer margin—situate between the two lower median nervules; posterior wings having the costal and outer margins somewhat broadly infuscated, and in the male with a costal tuft of pale ochraceous hairs near base. Wings beneath fuscous; a dark waved and obscure narrow linear fascia crossing cell of anterior wings, and two similar ones crossing cell of posterior wings; both wings crossed beyond middle by a violaceous fascia, beyond which on anterior wings are two large ocellated spots, the uppermost smallest, both blackish, with white centres and narrow ochraceous outer margins, which are again surrounded by an outer pale waved marginal ring; these outer rings approach one another, and at their prolongations each contains an additional minute and obscure greyish spot; posterior wings with seven ocellated spots as on anterior wings, the fifth largest, the sixth and seventh contained in one encircling ring, and a more minute and much more obscure spot above anal angle; both wings with three narrow marginal pale fasciæ, the outermost fringe-like, the innermost broadest and scalloped. Body and legs more or less concolorous with wings.

Exp. wings.—48 millim.

Hab. Perak (Künstler—coll. Ribbe).

This species belongs to the section of the genus which has been generically separated by Mr. Moore under the name of *Loesa*. It is intermediate in form between the Javan *M. oroatis*, Hew., and the *M. surkha*, Marsh. = *M. fervida*, Butl. found in Upper Tenasserim.

M. ustulata will be figured in the Appendix to my 'Rhopalocera Malayana.'

CUCULLIA ARTEMISIÆ ADDED TO THE BRITISH FAUNA.

By W. Brooks.

WHILE sugaring near Starcross, in Devonshire, on Friday evening, August 21st, 1885, I took a couple of dull-looking insects which were at rest on a post in an oak fence about two feet apart. It did not strike me at the time that they were of any value, and I thought no more about them. An old entomologist happening to call in the other evening, and seeing my recent captures, at once noticed my two dull-looking strangers, and pronounced them to be a rare *Cucullia*. He has since kindly got them identified by Mr. Butler, of the British Museum, as *Cucullia artemisiæ* (*abrotani*), an unlooked-for and an unexpected prize.

[*Cucullia artemisiæ* has long been in the list of reputed British species, and now enters our fauna upon the identification of Mr. Butler, of the British Museum. The date of Mr. Brooks's capture appears to be abnormal, as it is one upon which we should expect to find a full-fed larva upon flowers of wormwood, rather than an imago of *C. artemisiæ*, which on the Continent appears in May and June. In our list of British Lepidoptera this species will come between *C. gnaphalii* and *C. absinthii*. The following is a short description of *C. artemisiæ*:—Expanse, one inch and three-quarters. The anterior wings are narrower than those of *C. absinthii*; ground colour dark gray, varied with paler; transverse lines somewhat distinct; inner margin less dark than in *C. gnaphalii*; inner line with deep indentations, the elbowed line being sharply broken over the inner margin; the stigmata are both light, with darker centres and borders. Posterior wings are like those of *Cucullia absinthii*.—J. T. C.]

The Lodge, The Oaks, Lower Norwood, S.E., Sept. 12, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ANOSIA ARCHIPPUS IN CORNWALL.—I have much pleasure in recording the capture of *Anosia archippus*, Fab., on Sept. 21st last, by my friend Mr. Harris Saundry (who, though not an entomologist, was struck by the size of the insect), flying heavily over a stubble field adjoining the village of Trevilly, about half

a mile from the Land's End. He kept it alive until the 25th inst., when he handed it over to me, and mentioned his having noticed a larger insect of the same species flying at the other end of the field; but having no net he could not capture it. I took the specimen home alive, and the following morning wrote to Mr. Carrington, enclosing an insect I already had in a Jamaican collection, which resembled the one I had just received, asking that he would have it named for me, and make the capture public. Mr. Carrington being out of town, this communication was answered by a letter from Mr. Jenner Weir, who has most kindly supplied me with the information, and some interesting notes of his own, recording the capture of the same species on two occasions; once at Lindfield, and again at Keymer (Sussex). I kept my specimen alive until the morning of October 1st, when (as the weather continued too stormy to give any hope of capturing the other insect, which I thought might be the female) I opened the tin case in which it was confined, and to my surprise the insect was quite lively and flew about the room. I then killed it by means of my cyanide bottle, and obtained a sketch, which I have sent to Mr. Weir, whom I now beg to thank for his courtesy in interesting himself so much in this capture. Should any of your readers pay a visit to this district I will be most happy to show them the insect.—R. J. ANDERSON; Eastern Telegraph Co., Porthcurno, Penzance, October 6, 1885.

[This communication of Mr. Anderson's is of great interest. I have already heard of the capture of *Anosia archippus* this year in the counties of Devon and Dorset; and I have hope that possibly it may effect a permanent settlement in this country. I have myself received the species from Moose Factory, in Hudson's Bay, where the snow lies on the ground for eight months in the year; and from Fiji, within the tropics. It would, therefore, appear that our climate would not be too severe, if a suitable plant could be found for the larvæ to feed upon. With regard to the proper name of the species, Mr. Moore, in his monograph of the "*Limnaina* and *Euplœina*," Proc. Zool. Soc., 1883, p. 234, describes it as *Anosia plexippus*; *Papilio plexippus*, Linn. Syst. Nat. ed., x., p. 471 (1758).—J. JENNER WEIR.]

ANOSIA PLEXIPPUS, Linn., IN CORNWALL.—On September 17th last, near the Lizard, Cornwall, my brother and myself started a large butterfly, which we captured, and found, to our great surprise,

to be a specimen of *Anosia plexippus* (*Danaus archippus*), in fine condition, and measuring four inches and a quarter in expanse of wing; and on the 24th we captured two others, both in the same fine condition and apparently freshly emerged, about a mile from the place where we had taken the first. These latter measured four inches and five-sixteenths and four inches respectively in expanse of wing. On the 29th I saw another specimen, which I was unable to capture, as it flew over the cliff. These insects were only seen by us on the very edge of the cliffs, especially where valleys with small streams led down to the sea; and in one of these valleys, with a large patch of ivy in full bloom on one of its slopes, we caught two specimens in one morning.—ALFRED H. JENKIN; Trewirgie, Redruth, October 16, 1885.

[Mr. J. Jenner Weir will have some remarks to make in the next number of the 'Entomologist' upon the occurrence of this species.—ED.]

LYCÆNA ARGIADES, Pall., IN SOMERSET. — A few months ago a gentleman living in this parish disposed of a small collection of Lepidoptera to me, having ceased for some time past to collect. The collection was fast going to ruin for want of attention, but I selected all those which were worth preserving, cleaned and "doctored" them, and placed the best and most uncommon specimens in my cabinet. Among these I noticed two small blue butterflies which somewhat resembled on the upper surface of the wings the male of *Lycæna icarus*, with the exception of "a small, slender, but quite distinct, black, white-fringed tail." I could not quite make them out, and the tail puzzled me. On seeing the woodcut of *L. argiades* in this month's 'Entomologist' I at once recognised a strong likeness between it and my two specimens. Comparing them together, and carefully examining the insects with Kirby's description, I found that they were undoubtedly *L. argiades*,—both male specimens,—and agreed in every detail with the description. On talking over this discovery with my friend, he told me he took them with several others, eleven years ago, not two miles from this house, close by a small quarry. Thus *L. argiades* would seem to be not quite new to the British fauna. From its similarity both in colour in size to *L. icarus* it would be impossible to distinguish them on the wing, or even while settled on a flower; and this may in some way account for its not having come under notice before this. My authority for my specimens

being British is my friend above mentioned, and in the interest of the Science I am ready to submit a specimen for identification.—(Rev.) J. S. ST. JOHN; Whatley Rectory, Frome, Oct. 16, 1885.

[No doubt others will be found in various collections; but nevertheless to Mr. Pickard-Cambridge belongs the honour of adding *Lycæna argiades* to the British fauna. Entomologists should keep a sharp look-out for this addition next year.—J. T. C.]

NOTE ON *LYCÆNA ARGIADES*.—Any information with regard to *Lycæna argiades* may be of interest at the present moment. During the last week of August, 1882, I met with this species on the coast, a few miles south of Biarritz, in a locality which may be described as a very sandy heath. It was flying in company with *L. icarus* and *L. bætica*, both of which species it much resembled on the wing. — A. H. JONES; Shrublands, Eltham, Kent, October 3, 1885.

VANESSA ANTIOPA.—It may interest entomologists to know that a specimen of *V. antiopa* was seen on the cliffs at Charmouth, Dorset, on July 26th last.—A. BELT; Ealing, W., Oct. 24, 1885.

ABUNDANCE OF *COLIAS EDUSA* AND *VANESSA CARDUI* IN NORTH KENT.—Both these species have been plentiful this season, some hybernated *V. cardui* being out, as is their wont, till the new brood was appearing. *C. edusa* came out rather early; its abundance in 1885 is notable, as indicating that a dry summer does no harm to its caterpillar.—J. R. S. CLIFFORD.

COLIAS EDUSA IN NORTH DEVON.—On August 15th I saw one specimen of *Colias edusa* at Morte Bay; during a fortnight's stay in the neighbourhood I saw no other. A correspondent in Torrington, N. Devon, informs me that one male specimen was caught there this year. I may add that, while staying in North Devon in 1882, I saw none.—F. H. P. COSTE; Tottenham.

CHÆROCAMPA CELERIO AT RETFORD.—I have again to record taking a specimen of *C. celerio*. It settled on a window-pane in a street near my garden, and was promptly brought to me.—S. PEGLER; Retford, October 2, 1885.

CHÆROCAMPA CELERIO AT EALING.—I have seen a fairly good specimen of *Chærocampa celerio* captured here, at Ealing, on September 12th, by S. P. Deane, a young friend living at 36 Windsor Road, who caught it flying over Russian balsam

about 8.30 p.m., upon which a street lamp was shining brightly.—J. MORTIMER ADYE; Ealing, London, W.

CHÆROCAMPA CELERIO IN ESSEX.—I am glad to be able to add another to the long list of captures of *C. celerio*, Mr. E. Bidwell having given me a specimen which had been caught by his nephew, Master H. H. Cotman, at No. 2, East Terrace, Walton-on-the-Naze, Essex, on September 15th. The insect when found was resting on the staircase, and was then quite perfect, but, having been kept in a box alive for four days, was somewhat injured.—J. R. WELLMAN; 8 Medora Road (late 219), Elm Park, Brixton Rise, S.W., October 12, 1885.

CHÆROCAMPA CELERIO AT FOLKESTONE.—A specimen was caught in the town of Folkestone during the second week in September, and brought to Mr. Purday, who gave it to me.—J. A. COOPER; Sussex Villa, Leytonstone, October 20, 1885.

CHÆROCAMPA CELERIO AT BOURNEMOUTH.—I have just learned from Mr. Adye, who captured a beautiful specimen of *Chærocampa celerio*, as recorded in this month's 'Entomologist' (xviii. 262), that another specimen of *C. celerio* has been taken a few days ago by the Rev. E. Brackenbury, of this town.—W. McRAE; Bedford House, Bournemouth, October, 1885.

CHÆROCAMPA CELERIO, &c., IN DEVONSHIRE.—On September 16th I caught a female *C. celerio* at Lee, near Ilfracombe. It was flying at dusk, and visited stocks and fuchsias. I also found two *Sphinx convolvuli* at rest, on August 30th and September 6th respectively; I saw two or three others on the wing. They seem to have been common this year, as I have seen several taken by a friend at Buckfastleigh, besides one at Cambridge.—W. F. BLANDFORD; 71, Grosvenor Street, W., September 25, 1885.

CHÆROCAMPA CELERIO AT PLYMOUTH.—On the 19th ult. a friend brought me a fine specimen of this moth, which he caught in his drawing-room, at The Crescent, Plymouth, the previous evening.—J. P. CREGOE; Headland Park, Plymouth, Oct. 3, 1885.

COLIAS EDUSA, ACHERONTIA ATROPOS, SPHINX CONVULVULI, AND CHÆROCAMPA CELERIO.—Whilst staying at Lyme Regis in August, with my friend Mr. A. R. Wallace, we noticed that *Colias edusa* was fairly common, the butterfly confining its visits almost entirely to the yellow flowers of the fleabane (*Pulicaria dysenterica*),

which grows so plentifully about the undercliff. *Acherontia atropos* appears also to have been unusually common this year in the larval state. In addition to the captures already recorded in the 'Entomologist,' I know of specimens having been taken at Oxford and Twickenham. *Sphinx convolvuli* appears to have been common throughout the South of England this year. Thus there have been reported to me the capture of three specimens at Hurstpierpoint, in Sussex; of two specimens at Portewood, near Southampton; and two at Godalming. On the evening of September 6th, whilst mothing in a garden at Sevenoaks, my cousin, Miss Constance Carvalho, and I each took a fine specimen hovering over the flowers of the "evening primrose" (*Oenothera biennis*). This observation is of interest, as Hermann Müller does not record *S. convolvuli* among the visitors to *Oenothera*. The moths captured by my cousin and myself had the proboscis well dusted with the yellow pollen of the flower. I noticed also that the male of this species possesses the scent-tufts on the ventral side of the base of the abdomen, to which attention has already been directed by Fritz Müller (Proc. Ent. Soc. Lond., 1878, p. ii). Another specimen has since been taken at Sevenoaks. I have just had reported also the capture of a specimen of *Chœrocampa celerio* at the beginning of the month, at Hurstpierpoint.—R. MELDOLA; September 26, 1885.

ACHERONTIA ATROPOS AND MACROGLOSSA STELLATARUM AT SEA.—On August 26th, while homeward bound from Australia and when entering the chops of the Channel, two very fine specimens of *A. atropos* were captured on board the ship; and on the 11th of the same month, while we were at anchor off Algiers, a damaged specimen was brought to me by one of the blue-jackets. A few nights afterwards, between Algiers and Gibraltar, while we were smoking on deck, an *atropos* alighted at the feet of one of the officers and ran squeaking up his leg, much to his astonishment; but it flew away before it could be captured. *M. stellatarum* was to be seen every day between Malta and Gibraltar; and on August 25th, two days before we reached Plymouth, one was observed flying about the ship.—GERVASE F. MATHEW; Instow, N. Devon, October 8, 1885.

SPHINX CONVOLVULI AT BURY.—On September 13th a specimen of this species was found at rest on a tombstone in the cemetery.—R. KAY; 3, Ingham Street, Bury St. Edmunds.

ABUNDANCE OF SPHINX CONVULVULI AT BOURNEMOUTH. — Lepidopterists in this part of the country will probably long remember the autumn of 1885 as the "*Convolvuli* year." The specimens of this species which have been seen and captured in this locality far exceed in number those of any season for at least twenty years. The long dry summer seems to have been peculiarly favourable to the development of the larger Sphingidæ generally. From an early date in August till about the middle of September *Sphinx convolvuli* was taken plentifully, both at rest in the daytime and on the wing at night, in all parts of the town. During this time I alone netted over three dozen fine specimens hovering over flowers both in my own and in our public gardens; and altogether I venture to say that not less than a hundred have been taken in various ways in this neighbourhood. Sugared bouquets of flowers, consisting chiefly of honeysuckle, geraniums (pale), and petunias, I found to be a most attractive bait; and I would strongly recommend the adoption of this plan to collectors who cannot get access to any large beds of flowers. In fact, judging from my own experience, had I been able to procure honeysuckle in sufficient quantity, I certainly should have confined myself mainly to this kind of bait. I noticed that white and pale-coloured flowers were far more attractive than those of deeper hues. I attribute this simply to the fact that the former are more conspicuous at night than the latter. Has anyone ever detected any sound proceed from the rapid vibration of the wings of this moth during its hovering flight? I listened most carefully, but in no instance did my ear detect the slightest whirr or sound of any kind. My opinion is that its flight is perfectly noiseless. I am sorry to add that I failed to obtain any eggs, although I kept five likely females alive for some time for this purpose. We have instances on record of eggs being obtained in the autumn (Entom. vi. 545, xviii. 259); but as no subsequent mention of the larvæ from the former eggs is made, we may be justified in assuming that they were not fertilized. I believe it is asserted by some entomological authorities that *Sphinx convolvuli* do not pair until after hibernation, and my experience favours this conclusion. I have, however, a strong suspicion that in this country very few, if any, of the moths survive the winter. Is it not more probable that part of the pupæ remain through the winter, emerging the following May or June, and that copulation takes place between the sexes of

these only? Dr. Boisduval, in his elaborate description of six distinct and well-marked varieties of the larvæ of this species, states that they feed upon various species of *Convolvulus*, but particularly upon *C. arvensis*; and to obtain this caterpillar it should be looked for, in July, in fields where *C. arvensis* grows among crops of potatoes or beans. From its size, and excrements lying round the plants, he says it is easily detected. In this country, up to the present time, no one, so far as I know, has seriously attempted to verify this statement. The larvæ must have been, this season at least, quite as numerous as the moths; and I cannot help believing that a judicious and systematic examination of *Convolvulus arvensis* and *C. sepium*, wherever found, by even a few experienced collectors, must have resulted in the discovery of numbers of larvæ. — W. McRAE; Bedford House, Bournemouth, October, 1885.

SPHINX CONVULVULI IN SUSSEX. — This fine moth has occurred here twice this season, two specimens in good condition having been taken by a friend of mine. The first was taken on August 17th, settled on some palings; and the second, near the same place, about September 12th. It seems to have been found very plentifully in most places this year.—W. H. BLABER; Beckworth, Lindfield, Sussex, October 8, 1885.

CALLIMORPHA HERA IN DEVON.—In the 'Entomologist' for 1884 (vol. xvii., p. 233) I gave an account of the occurrence and capture of *Callimorpha hera*. Early in August, 1885, I journeyed to the pretty little seaside village of Starcross, at the mouth of the Exe, about two miles and a half from Dawlish, which place I have annually visited for the last six years. I commenced work on the 10th with a very dull prospect, for nothing could be disturbed by beating. On the 12th Mr. Waring and I had gone up a narrow lane to return with but little for our labour, when my son, a lad of twelve years of age, strolling later into the lane, to his surprise saw one of the insects of our search on the wing, which he succeeded in capturing. On the 16th, while returning from the Warren, an enclosure from the sea, which in places is covered with heath, thrift, galium, and rushes, where we had been taking the pretty little *Mesotype virgata* (*lineolata*), which was in some abundance, we took to the woods, through a large orchard, into a narrow lane, where we commenced to beat,

and very soon dislodged our second specimen of *C. hera*, which was a female in fair condition. A gentleman from London, staying at Dawlish, has succeeded in taking two others, one being a variety. *Lycæna icarus* was in extraordinary abundance; and *Epinephele tithonus* was equally common. *Colias edusa* was seen or taken on most days; and *Thecla quercus* was in plenty in a forest on Holden Hill, where we took about four dozen in less than an hour. On the cliffs at Dawlish we succeeded in taking two dozen each of *Acidalia marginepunctata* (*promutata*); I counted five within the space of a foot sitting with their wings extended on the red sandstone. Of Noctuæ there was a general scarcity, but few of the common species being met with; and sugaring proved quite a failure.—W. BROOKS; The Lodge, The Oaks, Lower Norwood, S.E., September 12, 1885.

DEIOPEIA PULCHELLA IN HAMPSHIRE.—On October 6th, 1876, my pupils and I were fortunate enough to take two fine specimens of *D. pulchella* on the moorland between Bournemouth and Christchurch, now known as Southborn-on-Sea; and on the same date, in the same locality, there is a record of the capture of five specimens by the Rev. E. Brackenbury, of this town (Bournemouth), and his pupils (Entom. ix. 258). Since that time I have been in the habit of visiting the locality annually two or three times with the hope of finding more of this rarity, but each time failed to turn the species up again. The operations of the "brick and mortar" speculation in this neighbourhood have been so extensive and continuous of late years that my hopes (at one time well grounded) of the permanent establishment of *D. pulchella* in the locality were with each succeeding year becoming fainter and fainter. I have, however, a strange fascination for the spot where a rarity has once been captured, and, led by this, I again visited the old ground on October 7th and spent a couple of hours, with my usual success, nil. When about to return home, however, my little dog dashed past me in pursuit of a rabbit, and, rushing in among some ferns, started a pale-looking insect, which I instantly netted, and found to be *D. pulchella*. While engaged in bottling my prize some children came up, and to satisfy their curiosity I showed them my capture, when one of them said, "Harry has a butterfly like that"; and sure enough, to my surprise, in an old mustard-tin the little fellow actually had a living specimen of *D. pulchella*, with sundry still more lively grasshoppers, &c., all boxed

off the moor within the previous hour. They had no net or other apparatus, and, as far as I could learn, they found the *D. pulchella* at rest on the ferns. I at once struck a bargain for the "butterfly," leaving them in possession of the grasshoppers, which seemed equally appreciated by them. On examination I was glad to find the insect had sustained little damage from either the handling of its juvenile captors or from its ill-assorted fellow-prisoners.—W. McRAE; Bedford House, Bournemouth, October, 1885.

PLUSIA INTERROGATIONIS AT LIGHT.—At the end of August this year I took a worn specimen of *Plusia interrogationis* at light in Cambridge. As this species is, I believe, generally only found on moors, it may be worth recording.—A. ROBINSON; Brettanby Manor, Darlington, October 8, 1885.

APOROPHYLA NIGRA IN DORSETSHIRE.—On October 6th my brother, Mr. C. A. Marriott, took a fine specimen of *A. nigra* at Hamworthy. It was flying round a lamp in a room. — F. F. MARRIOTT; 11, George Lane, Lewisham, Kent.

PHIBALAPTERYX POLYGRAMMATA [NOT] IN ESSEX — This species was obtained at Felsted, by one of the members of the Natural Science Society at Felsted Grammar School, in the course of last year; and afterwards bred, as far as the pupa, from eggs obtained by him. There is a short description of the larva in the report of the Society for 1884.—FRANCIS C. WOODBRIDGE; Lewes, Sussex.

[The notice of this species, in the recently issued 'Third Annual Report of the Felsted School Natural Science Society,' at once attracted my attention, and I also saw that an old error had again misled others. It is time it was corrected. Knowing that in Newman's 'British Moths' the figures and descriptions of *Phibalapteryx vittata* (*lignata*) and *P. polygrammata* (*conjunctaria*) were transposed, I at once communicated with Mr. J. M. Bacon, of Swallowfield Vicarage, Reading, through the Rev. A. W. Rowe, and received the following reply:—"I am afraid that your supposition is correct; the moth of which I obtained the larva is the one which is represented in fig. 343, p. 175, of Newman's 'Moths,' and named *P. conjunctaria*. As I have had but small experience, and have had no one to refer to in any case of doubt, I have had to fall back upon my book, and hence the error." This very excusable error is not without its results, and does not greatly

mar the entomological report of a school society, in which it is pleasing to read that "It was very gratifying to see so much more energy displayed during last year than had been shown in previous years; and, now that the movement has been so well started, there is every reason to hope that it will continue to the benefit of those who are fond of the study of Entomology and of the Society in general." The life-history of *P. vittata (lignata)* is given by the Rev. J. Hellins, in Ent. Mo. Mag., viii., 18; and by Hoffmann, in Stett. ent. Zeit., xliii., 101.—E. A. F.]

ASTHENA BLOMERI.—In reply to Mr. St. John (Entom. xviii. 263), Pflümer took this species in Hanover as early as May 12th (Stett. ent. Zeit., xl., 159); and Hellins had eggs laid in July and August (Ent. Mo. Mag., xi., 87).—EDWARD A. FITCH; Maldon.

NOTES ON LEPIDOPTERA OF THE YEAR.—On August 3rd and 10th I captured at Andover several fresh specimens of *Colias edusa*, all males. On August 18th I found larvæ of *Notodonta trepida* and *N. trimacula (dodonea)* in Savernake Forest.—(Rev.) C. A. SLADEN; Burghclere, Newbury, October, 1885.

NOTES FROM MY DIARY: LEPIDOPTERA.—The insect mentioned (Entom. xviii. 246) as *Notodonta bicolor* should be *Sehirus bicolor*, Linn., one of the Heteroptera. I found two specimens of this pretty species at Orpington amongst ivy, &c., while collecting shells. [This error was corrected on the wrapper of the number in which it occurred.—ED.] I continue my notes up to the present date. August 13th.—Saw a male *Gonopteryx rhamni*, at Chislehurst, visit first a flower of *Centaurea nigra* and then one of *Carduus arvensis*. Has anyone noticed that *G. rhamni* seems particularly fond of pink flowers? On September 18th one of these butterflies spent fully a quarter of an hour over pink pelargonium; but, nevertheless, it seemed fully conscious of its conspicuousness on the pink blossoms, for when purposely alarmed, it at once flew to some green foliage, where it was scarcely visible. August 18th.—Found a specimen of *Triphæna ianthina*. This species has been unusually abundant at Chislehurst this year. On September 8th I received a specimen from Cabourg-sur-mer, North France.—T. D. A. COCKERELL.

LEPIDOPTERA AT SOUTHPORT.—In the middle of August last I found *Agrotis tritici*, *A. aquilina*, and *A. obelisca* occurring together

on the sand-hills at Southport; the other species of the genus with them being *A. vestigialis* (*valligera*), *A. cursoria*, and *A. præcox*. In the daytime *Phytometra viridaria* (*ænea*) was common, but very much worn; the specimens were larger, and the few good ones seen were brighter in colour than I have ever noticed in the various inland localities I have seen the species. *Leucoma salicis* was common at the lamps, and had evidently occurred in the greatest profusion, for the cocoons containing the empty pupæ were to be seen spun up "in bunches" at the ends of the willow shoots; whilst many larvæ had crawled off the bushes and spun up in the dock and other large leaves near, often a number on a single plant.—GEO. T. PORRITT; Huddersfield, October 3, 1885.

AUTUMN SUGARING AT CHRISTCHURCH.—Autumnal sugaring has been good here this year; in one evening I have seen nearly a hundred moths on a small patch. It would be quite unnecessary to mention all I have taken, but the following is a list of the most important:—*Xylina socia* (*petrificata*), *X. semibrunnea* (three), *Agrotis saucia* (numerous), *Calocampa exoleta*, *Aporophyla lutulenta*, *A. nigra*, *Xanthia flavago* (*silago*), and *X. fulvago* (*cerago*).—J. M. ADYE.

XANTHIA FERRUGINEA FEEDING ON ASH. — On May 3rd, in walking along the road at Box Hill, I passed under a very large ash-tree, the decaying flowers of which had fallen off in quantities. On examining one of these I found a small *Noctua* larva therein. I collected sufficient to fill a small tin, and on reaching home threw the contents into a jam-pot, with a few of the unexpanded buds of the ash. On examining it at the end of a week I found four larvæ, which grew rapidly, and when full fed were put into a small pan filled with earth. Early in September the four moths emerged, much larger, darker, and richer in colour than those in my cabinet. As I believe the seed of the wych elm is given as the food of this species, I thought it would interest the readers of the 'Entomologist' to know it is also to be obtained from ash.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., October 17, 1885.

SOUND-PRODUCING LARVÆ.—Can the larva of *Acherontia atropos* produce a sound? As this insect has been common in the larval state this summer, evidenced by reports already

published, it is to be hoped some observations on the above vexed question may be forthcoming. Fuessli is said to have been the first entomologist who noticed it, and that accurate observer, Newman, confirms what he had stated. Though Kirby and several other authors refer to the circumstance, it seems to be doubtful whether they had themselves had proof. By some entomologists doubt has been thrown upon the statement. A larva I had recently in my possession was obstinately silent, but died before it was adult. Perhaps the larva loses the power in captivity, just as that of *Dicranura vinula*, when imprisoned, appears no longer to employ its peculiar squirt.—J. R. S. CLIFFORD; Gravesend, Oct. 3, 1885.

SIREX JUVENCUS AT SOUTH NORWOOD. — A friend of mine captured a fine female specimen of *Sirex juvencus* on the 20th of last September; he found it buzzing about in a fender in his house at South Norwood. Not knowing what it was, he boxed it and handed it to me a fortnight after, when it was still alive and quite perfect; so I liberated it in my studio, and it flew about with a swift, steady flight, making a very loud buzzing hum; the deep metallic blue body and gold bronze wings gave it a handsome appearance when flying. As I did not know what *Sirex* it was, I sent a coloured drawing to Mr. Carrington, who kindly named it for me. — F. W. FROHAWK; Park Place, Eltham, Kent, October, 1885.

SIREX JUVENCUS AT BOGNOR.—A fine female of this sawfly has been brought to me, having been captured in the vicarage on September 27th. Is this really a British insect, or may it have been imported in the timber used in building the vicarage, which was newly erected three or four years ago? I can find but very few records of its occurrence in this country, and none of its appearance in this immediate locality.—A. LLOYD; The Dome, Bognor, October 14, 1885.

SIREX JUVENCUS.—Which is the commoner of the two *Sirices* — *S. gigas* or *S. juvencus*? Judging from my own experience I should say that *S. juvencus* is rather a rare species, for whilst both here and in Hampshire several specimens of *S. gigas* have from time to time fallen into my hands, I have never till this present season had the pleasure of seeing *S. juvencus* alive; but on September 23rd my friend Dr. Arthur E. Buckell, of this town,

captured a fine female, which he sent to me. She deposited in the box a number of eggs.—JOSEPH ANDERSON, jun.; Chichester.

[Both species of *Sirex* appear to have been unusually common this present season, for quite a number of *S. gigas* and several *S. juvencus* have been sent for identification to the office of the 'Field' newspaper.—J. T. C.]

THE MIGRATION OF APHIDES.—In relation to migration of Aphides, referred to by Mr. Clifford (Entom. xvi. 290), I may say that it occurred in Huntingdonshire. A friend and I were tricycling from St. Ives to Fen Stanton, and during the ride we became covered with Aphides. They got into our eyes, and were very annoying. My friend, who did not know their habits, was surprised to see their numbers. In some parts of the journey they were in clouds; in fact they became so excessively troublesome that we turned back without accomplishing our journey. The afternoon was oppressively hot, the wind being due south. This migration lasted for three days, according to my observation, from July 26th to 29th. I conclude if the weather is pretty uniform in temperature all over the country the Aphides migrate about the same time; but no doubt other correspondents will give their experience.—HERBERT E. NORRIS; St. Ives, Hunts, Oct. 3, 1885.

TELENOMUS PHALÆNARUM, *Nees*.—I have again bred this small egg-parasite; this time from *Pygæra bucephala*, and one only from each egg; these were all females. Those from *Bombyx trifolii* (Entom. xviii. 247) contained both sexes.—G. C. BIGNELL; Stonehouse, Plymouth, Sept. 9.

"TRESPASSERS WILL BE PROSECUTED."—Such is the notice that meets one on every hand in the New Forest now. Whether Mr. Lascelles, the present Ranger of the Forest, has the legal right or no, he is having boards to this effect nailed on trees at the entrances to many of the enclosures. This is a matter which I think all entomologists will agree with me in considering of the greatest importance, and one that should have some explanation.—P. BRIGHT; Roccabruna, Bournemouth, October, 1885.

OCNERIA DISPAR: CORRECTION.—In my account (Entom. xviii. 263) of the occurrence of *Ocneria dispar* in Warwickshire, the sentence beginning, "They were at the time of feeding," &c.; for "feeding" read "finding."—W. H. BLABER.

REVIEW.

Handbook of European Butterflies. By W. F. DE VISMES KANE, M.A., M.R.I.A. Fifteen plates and 184 pages, 8vo. London: Macmillan & Co. 1885.

THIS small volume forms a very welcome adjunct to Dr. Lang's 'Butterflies of Europe.' The latter book is too valuable and bulky to be used as a *vade mecum* by the entomologist when travelling on the Continent; but Mr. Kane's book exactly fulfils the necessary conditions.

There are 15 plates, containing 134 figures, done by a photographic process; partly, it would appear, by the Typo-Engraving Company, and partly by the employment of the isochromatic plates prepared by Messrs. Attout Tailfer and John Clayton, of Paris. Of course this mode of illustration reproduces the irregularities of the setting, and all the defects of the specimen figured; but, on the other hand, there can be no dispute as to the faithfulness of the representations. Some of the plates are excellent, notably plates vii., xi., xiii., and xiv. The genera *Argynnis* and *Melitæa* appear to have presented considerable difficulties in the delineation of the upper sides; but even in these instances the under sides figured in plate x. are very characteristic.

The introduction is pleasant reading; and Mr. Kane gives clear directions as to the apparatus necessary for taking and bringing home a collection of butterflies in a small compass. He recommends placing them in the usual triangular envelope, of which a figure is given. There is another plan, which he does not mention, *viz.*, placing them in pill-boxes, with a disk of paper between each flat specimen.

The letterpress of the body of the work is well written; and the key to the different genera will prove of great assistance to the beginner.

The "List of European Rhopalocera, with their principal Synonyms," has been prepared with great care; and it is much to be hoped that it will be issued separately, printed on one side of the paper, to serve the purpose of labels.

Mr. Kane may be congratulated in having supplied a distinct want.

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ANOSIA PLEXIPPUS, LINN.

BY J. JENNER WEIR, F.L.S., F.Z.S., F.E.S.

IN the 'Entomologist' for 1876 (vol. ix., pp. 267, 268) I gave a short account of this insect under the name by which it was then generally known, viz., *Danaïs archippus*, Fabr. A figure of the larva was also given attached to the Rev. T. E. Crallan's communication, recording the capture of the insect at Lindfield, Sussex, near Hayward's Heath (Entom. ix. 265). Mr. McLachlan has been good enough to furnish me with an unrecorded instance of the capture of this butterfly near Poole, Dorsetshire. The date of capture is not quite certain, but was probably 1876, the year in which others were taken in England and South Wales.

This year nine specimens of the insect have been seen on the wing in the counties respectively of Dorset (Ent. Mo. Mag., xxii., 134), one specimen captured; in Devonshire, one was captured at Plymouth, and formed the subject of a communication read at the meeting of the Entomological Society in October last; six, of which four were taken, occurred in Cornwall (Entom. xviii. 290, 291); and Mr. Lester Arnold, Bedford Park, Chiswick, writes to me that a fresh and strongly-marked specimen was seen by him on the Ventnor Parade, Isle of Wight, early in September last. It was not caught, but he has no doubt of the identity of the insect, having had opportunities of seeing allied Danaine butterflies in their native countries, and being familiar with our British species. The insect flew low down within a foot or two of

Mr. Arnold, and he distinctly saw the markings; and states that amongst the flowering myrtles and geranium bushes of the warmest part of England it did not look out of place. This is the ninth specimen of *A. plexippus* recorded as having been seen in England this year. No doubt numbers have been seen, and their appearance has not been recorded.

I have been in correspondence with Messrs. Anderson and Jenkin, and in each case, of the four Cornish specimens, there seems no reason to doubt but that they were actually bred in this country. It is, therefore, probable that some impregnated females crossed the Atlantic, and deposited their eggs on a plant capable of affording food to the larva.

Anosia plexippus, according to Professor Riley, in the 'Third Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri' (1871, pp. 143-152), is in that State double-brooded. The hibernating female appears in May, lays eggs, and the first butterflies emerge about the middle of June; these lay eggs again, and the second brood appears on the wing in October. Probably in the region of Hudson's Bay, from which I have received the insect, it is but single-brooded. The inclement climate of the latter district does not affect the size of the imago indeed I have one from Moose rather larger than a specimen Mr. P. Crowley gave me from Fiji, both males.

Two of the plants on which the larva feeds, viz., *Asclepias tuberosa* and *A. purpurascens*, are hardy in this country; and it would be very desirable to ascertain whether either of these plants are grown in any of the gardens near the spot where the specimens under consideration were captured.

Professor Riley, in the same report, states that the imagines often appear in immense swarms, millions filling the air to the height of three or four hundred feet. If but a few of these descended and hibernated on board an ocean steamer trading to this country, they might even cross the Atlantic several times before they awoke from their winter's sleep.

The chrysalids are suspended in a similar manner to those of the well-known species of *Vanessa* and *Pyrameis*, and, like them, the chrysalis state lasts but a short time. The emergence takes place in about ten days from the period of transformation of the larva.

There appears to me to be a fair chance that *Anosia plexippus*

will establish itself in this country. I had a letter from the late Mr. Charles Darwin, in which he wrote that he shared my enthusiasm on the subject.

Chirbury, Beckenham, November, 1885.

DIURNI OF THE UPPER ENGADINE.

BY WILLIAM E. NICHOLSON.

DURING the summers of 1884 and 1885 I had the pleasure of spending the month of July and a few days of June in the Upper Engadine, in company with my father, when we diligently collected the butterflies of the neighbourhood. A list of what we captured may be acceptable to some of the readers of the 'Entomologist,' now that more interest is shown in continental Entomology.

We made St. Moritz our head-quarters for the greater portion of our first visit, and Pontresina for the whole of our second visit. Pontresina is by far the best centre for entomological excursions, as it is also for mountain excursions, as from thence most of the best localities can be easily worked; notably the Bevers Valley, the Roseg and Morteratsch Valleys, and the Heuthal. The only good localities easier to work from St. Moritz were Alp Laret and the Fex Valley. The month to choose for collecting in the Engadine is July, as very few species occur in June, and at the end of July all the fields have been mown, and most species are getting worn. I am indebted to the kindness of Dr. Lang for the names of several of the species mentioned in the following list:—

Papilio machaon, rather common near St. Moritz in 1884, but scarce in 1885.

Parnassius apollo, abundant near St. Moritz, but not so common near Pontresina. *P. delius*, common in the neighbourhood of Pontresina, especially in the Roseg Valley; it was also abundant in the Fex Valley.

Aporia crataegi, abundant early in July, but soon over.

Pieris brassicæ, *P. rapæ*, and *P. napi*, common nearly everywhere, but not abundant. *P. napi* was the commonest; and the aberration, *bryonia*, was not rare, but difficult to obtain in good

condition. *P. callidice*, common in several places, especially near the Bernina Hospice, but very swift on the wing.

Euchloe cardamines, twice noticed near the summit of the Maloja Pass.

Leucophasia sinapis, common in the woods round St. Moritz.

Colias palæno, common near the Morteratsch Glacier; the aberration, *werdandi*, was also rather common near the Bernina Falls. *C. phicomone*, very abundant everywhere. *C. edusa*, worn specimens were not uncommon near St. Moritz in 1884, but fresh specimens were rare; probably commoner later on in the season. *C. hyale*, one specimen was captured near St. Moritz, and another noticed near Pontresina.

Gonepteryx rhamni, twice noticed near St. Moritz in 1884.

Thecla rubi, one specimen was noticed near Pontresina.

Polyommatus virgaureæ: this beautiful species was very abundant, sunning itself with expanded wings or flitting from flower to flower; the females also were very common on the flowers of a certain small species of *Senecio*, and rather darker than the usual type. *P. hippothoe* var. *eurybia*, not quite so common as the preceding, but widely dispersed. *P. dorilis* var. *subalpina*, not very common; occurred chiefly in a wood at the foot of the Schafberg.

The genus *Lycæna* was represented by no less than sixteen species, most of which were common, and liable to great variation in the markings of the under side of their wings. *L. argus*, abundant everywhere, except at a great elevation. *L. optilete*, rather common in a wood opposite Pontresina, and in the Roseg and Morteratsch Valleys; usually in peaty places. *L. pheretes*, common near the Languard Fall at the end of June and beginning of July. *L. orbitulus*, common on the Muottas Murail and other places at a great elevation. *L. astrarche* (*agestis*), common in several localities, and very dark. *L. eros*, occurred in many places singly, but was rather common in the Bevers and Fex Valleys; the females, however, were scarce everywhere. *L. icarus* (*alexis*), common everywhere; some of the specimens were very fine. *L. eumedon*, common at the foot of the Schafberg. *L. bellargus* (*adonis*) and *L. corydon*, common almost everywhere; the *corydon* were not so strongly marked as our English ones. *L. damon*, common near St. Moritz, on a bank covered with sainfoin. *L. donzelii*, common in the openings in larch woods,

at the foot of Schafberg, and in the Roseg Valley. *L. minima* (*alsus*), common in weedy places. *L. semiargus* (*acis*), occurred in similar places. *L. alcon*, a few specimens were captured near the Morteratsch Glacier. *L. arion*, a very dark form occurred, but was not very common, chiefly near the Languard Fall.

Vanessa urticæ and *V. cardui*, abundant everywhere; I noticed them both on the Morteratsch Glacier, far from any sign of vegetation. *V. atalanta*, once noticed near St. Moritz. *V. antiopa*, one large specimen was caught near Pontresina.

Melitæa cynthia, rather common in the Murail Valley, where I found the larva. *M. maturna*, not common; occurred several times in the Roseg Valley. *M. aurinia* (*artemis*) var. *merope*, abundant in marshy places at a great elevation, especially on Alp Laret, near St. Moritz. *M. phœbe*, rather common near the Languard Fall; some of the specimens are very dark. *M. didyma*, abundant on the Schafberg; the var. *alpina* also occurred. *M. dictynna*, common at the foot of the Schafberg. *M. athalia*, common and very variable, both as regards size and intensity of markings. *M. aurelia* var. *britomartis*, not very common; occurred chiefly in the Heuthal. *M. parthenie* and var. *varia*, abundant in many localities, usually at a fair elevation.

Argynnis selene, not common; occurred near St. Moritz. *A. euphrosyne*, common in the woods round Pontresina. *A. pales*, very abundant; the vars. *napæa* and *arsilache* were also common; my father took a perfectly melanic specimen last year crawling along a ditch near Sils Maria; it is uniform black above, with a purplish tint, somewhat resembling that of *Thecla quercus*, and the markings on the under side of the hind wings are arranged in stripes. *A. amathusia*, rather common in the Bevers Valley. *A. thore*, one specimen was caught in a wood near the Pontresina Gorge. *A. ino*, rather common in the Bevers Valley. *A. latona*, common near St. Moritz, flying over a large bed of bugloss. *A. aglaia*, very abundant; often three of them would dispute the possession of a single thistle-flower. A gentleman, staying at our hotel, presented me with a beautiful melanic specimen, that he had caught in his hat in a meadow close to the village; it is rather larger than most specimens of *aglaia*, and somewhat resembles the var. *pelopia* of *A. niobe*, but is rather darker, and all the silver spots on the under side, with the exception of a few at the base of the wings, are blotted out with black. *A. niobe* and

var. *eris*, abundant everywhere; my father caught a specimen of the var. *pelopia* near St. Moritz in 1884.

Erebia epiphron var. *cassiope*, a few very dark specimens were captured in the Roseg Valley. *E. melampus*, abundant in every meadow. *E. mnæstra*, common on the Schafberg, just above the tree limit. *E. evias*, common near St. Moritz in 1884. *E. glacialis*, common on the summit of the Schafberg, but difficult to catch on account of its frequenting dangerous precipices. *E. lappona*, common on the Muottas Murail. *E. tyndarus*, abundant in many places, at a lower elevation than *E. lappona*. *E. gorge* and var. *triopes*, common near the Bernina Hospice and in the Heuthal. *E. goante*, abundant near the Languard Fall towards the end of July. *E. euryale*, very abundant; the females vary very much in their markings, some being very like *E. ligea*, and others more like *E. æthiops*.

I found no species of *Satyrus* or *Epinephele* in the Upper Engadine; and in looking at a type collection, made by the landlord of the Hotel Saratz, I noticed that he had not any also, although he had specimens of *Pararge mœra*, that he said he had caught there, but he had taken them a long time ago, and did not seem to know much about the species. It is plentiful in many of the lower passes on the way to the Engadine, from Chur or the Italian Lakes. *E. ianira* was very common at Bellagio, and occurred some way up the Maloja Pass, but not at such an elevation as Pontresina by a thousand feet or more.

The only species of *Satyrus* that I noticed this year were *S. semele* and *S. dryas*, both common near Thusis, about 4000 feet lower than the Engadine. The Upper Engadine Valley lies at an elevation of 5550 feet at Pontresina to 6000 feet at St. Moritz; and I see that Dr. Lang says that *Epinephele ianira* does not inhabit the higher alpine regions. The common species of Satyridæ seemed to be replaced by the various species of *Erebia*. No doubt several species occur in the Lower Engadine; but we did not explore the Engadine lower than Bevers.

Cænonympha satyrion, abundant everywhere. *C. pamphilus*, not so common as *C. satyrion*; occurred in the Roseg Valley.

Syrichthus serratulæ, common near the Lake of St. Moritz, and several other places. *S. cacaliæ*, abundant often at a great elevation, especially in the Roseg valley.

Thanaos tages, not very common; occurred several times close to the village of Pontresina.

Hesperia lineola, a few specimens were caught in the Bevers Valley. *H. comma*, abundant in the Roseg Valley, and many other places.

Lewes, October 22, 1885.

A YEAR'S WORK AMONG THE GALL-GNATS (1885).

BY PETER INCHBALD, F.L.S., F.E.S.

I HAVE succeeded in reading a portion of the life-history of some few gall-gnats during 1885. Some species I have reared only sparingly, others abundantly.

The first gall-gnat to appear under the bell-glass was *Cecidomyia acrophylla* (Winnertz), which emerged from its cocoon on the 13th of May, and the gnats continued each morning to put in an appearance till nearly the close of the month. The larva of this gall-gnat affects the leaves of the common ash, causing sausage-like swellings to appear on the under side of the midrib of the upper leaflets. Each gall appears longitudinally on the rib, and contains from three to four tenants. When the larva is full-fed, which is in September, or early in October, the gall splits open on the upper surface of the leaf, and the tenant drops to the ground, and burrows into the soil. I reared the imagines in fair abundance, both male and female, from last year's affected leaves. Kaltenbach raised the gnat in 1874, in May and the early part of June.

C. cratægi (Winnertz) was my next hatch. It first appeared on the 2nd of June, and the gnats continued to appear till the end of the month. The metamorphosis is chiefly external, although occasionally, as Kaltenbach remarks, internal. The larva is instrumental in forming those terminal leaf-rosettes we notice on the shoots of quickset hedges. These contain several larvæ. The leaves of the rosette are curiously contorted and thickened, and thus made to furnish food and shelter to the reddish-coloured larva, which feeds within the leafy tuft. I bred the gnats, as I said, in considerable quantities, during the whole of the month of June. The bosses I gathered in July of 1884,

when the larvæ were nearly full-fed. Occasional sprinklings of water, so as to assimilate Nature, are quite essential for rearing these tiny gall-gnats.

The Cecid of the nettle-gall was the next to appear in the glass-topped box (*C. urticæ*, Perris). It put on wings on the 13th of June, and continued to do so for ten days or a fortnight, each morning giving me some three or four. The larva affects the leaf-stalk and ribs of the common nettle, the galls not unfrequently assuming a rosy tint. When fully grown the gall opens, and the larva falls to the ground, pupating in the soil, and spinning for itself a white and silken little web that is readily noticed. The larva of the nettle-gall, I may remark, differs in colour from the ordinary Cecid-larvæ. It is whitish during the whole stage of its larval existence. I bred several imagines, both male and female. Like other Cecids, it is very active in its winged state.

During the closing days of June and the first half of July I bred, in some abundance, from the woolly flower-heads of the milfoil or sneezewort (*Achillæa ptarmica*), the *Hormomyia ptarmicæ* (Vallot), the *H. floricola* of Winnertz, and others. I last bred it, by reference to my note-book, in 1861, in August. The affected flower-heads are readily noticed; for, as Winnertz remarks, "the whole flower-head is changed into a hairy crown." The pupæ of the gall-gnat occupy the central pseudo-florets, whence they emerge in the early morning hours, leaving their silvery shroud behind them in a vertical position. Sometimes, indeed, half the crown is tenanted, sometimes only three or four of the pseudo-florets. You will need to be an early riser to see the transformation scene. I bred fairly abundantly both *H. ptarmica* and *H. millefolii* in 1860 and 1861. The one affects the flower-head, the other the axils of the root-leaves, of the respective plants. An urn-shaped gall in the latter case is the result, which contains a single larva that pupates within the gall. The two gall-gnats are, indeed, as distinct in their economy, as in their specific characters. Winnertz, always a most accurate observer, was perfectly aware of their distinctness as species.

The last Cecid I bred this year is *C. persicariæ* (Linnæus). A single specimen emerged from its pupa-case on September 3rd. The others I shall not look for till June next. The larvæ feed

exposed, in company, and by their united efforts succeed in rolling up and thickening both the borders of the lanceolate leaves of the knot-grass (*Polygonum amphibium*), which change to a cherry-red colour. In the curled leaf they feed, and when full-fed they pupate, forming a slender oat-shaped cocoon of silk, that is intensely white. I have quite a bevy of cocoons, so that I hope to rear both sexes by due care and attention. Winnertz only reared the female, he tells us. I found the larva and pupa some few times in the same fold of the leaf, thus evincing diversity in feeding. Kaltenbach states that the larva lives in July on *P. amphibium*. This I invariably found to be the case, though *P. amphibium* and *P. persicaria* frequently grew side by side.

Fulwith Grange, near Harrogate, Nov. 10, 1885.

NEW FOREST: "TRESPASSERS WILL BE PROSECUTED."

BY HERBERT GOSS, F.L.S.

IN the November number of the 'Entomologist' (xviii. 303), Mr. P. Bright, of Bournemouth, states that Mr. Lascelles, the Deputy Surveyor of the Forest (or "Ranger," as Mr. Bright styles him), is having boards, intimating that "Trespassers will be prosecuted," nailed on the trees at the entrances to many of the enclosures; and he raises a question as to Mr. Lascelles' "legal rights" in so doing, and suggests that the matter is one that requires explanation.

In assisting, in 1875, the New Forest Defence Association in opposing the Bill, then before Parliament, for the enclosure and destruction of the whole Forest, it became my duty to make myself acquainted with the history of the New Forest, and the Acts of Parliament relating to its management and government; and I may, therefore, be competent to furnish some information on the question now raised by Mr. Bright.

The total area within the boundaries of the New Forest comprises some 92,365 acres, of which 27,140 acres are private property, 125 acres are copyhold of Her Majesty's Manor of Lyndhurst, 600 acres are leasehold under the Crown, 500 acres are enclosures belonging to Lodges, and 1000 acres are private

woods and plantations of the Crown; thus leaving 63,000 acres for the "woods and wastes" of the Forest.

The whole of these "woods and wastes" were, prior to 1698, open and unenclosed; but under the authority of the Acts 9 & 10 William III.* c. 36 (1698), and 48 George III. c. 72 (1808), the Crown was empowered to enclose, and keep enclosed, freed and discharged from all rights of Common, and from all manner of rights, titles, or pretences, or privileges, or claims whatsoever, such quantity of land in the Forest as would amount to 6000 acres, for the growth of timber.

By the Act of 14 & 15 Vict. c. 76 (the Deer Removal Act of 1851) the Crown was authorised to enclose and plant with trees any quantity of land, not exceeding 10,000 acres, in addition to the 6000 acres already in enclosure under the authority of the Acts before mentioned; and the 4th section provided that "The said enclosures so made and set out as aforesaid, shall remain in severalty, in the actual possession of the Crown, freed and discharged of and from all rights of Common, and of and from all manner of rights, titles, or pretences, or privileges, or claims whatsoever, during the period of the same remaining so enclosed, for the growth and preservation of timber and trees."

The powers conferred by these Acts are not repealed by 40 & 41 Vict. c. 121 (the "New Forest Act, 1877"); but the rights of enclosure are by Sec. 5 of the last-cited Act limited to "Such lands as are at the date of the passing of this Act enclosed, or as have, previously to such date, been enclosed by virtue of commissions issued in pursuance of the said Acts or some of them"; and by Sec. 7 of the Act the right to enclose is made subject to any "right of the Public to use any Public Highway which may traverse the said lands."

Assuming that the enclosures referred to by Mr. Bright have been made under the authority, and subject to the provisions, of the Acts of Parliament before quoted, and that they are not traversed by any "Public Highway," there cannot, I think, be any doubt that the Commissioners of Woods and Forests, on behalf of the Crown, and their local representative the Deputy Surveyor, have the power to exclude the public from such enclosures, and to warn them of the consequences of their trespassing therein.

* This Act was passed in 1691, but did not come into operation until 1698.—H. G.

Entomologists, botanists, and other persons desiring to enter the enclosures in question, should apply for permission to do so at the office of the Deputy Surveyor, Queen's House, Lyndhurst. Of course it is in the power of the Deputy Surveyor or his assistants to refuse such permission when applied for; but in my twenty-three years' experience of the New Forest, and of the conduct in this respect of the officials at the Queen's House, I am not aware of any instance of such a refusal.

Surbiton Hill, Surrey, November 12, 1885.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA POLYCHLOROS IN LONDON.—Early in the afternoon of the 7th inst., whilst passing along the south side of Smithfield Meat Market, I observed a large brown butterfly flying slowly about in the sunshine; presently it settled on the wall of the building, and to my surprise I saw it was a very fair specimen of *Vanessa polychloros*.—W. G. SHELDON; The Oval, Addiscombe, Croydon, October 18, 1885.

REAPPEARANCE OF VANESSA IO IN NORTH KENT.—I have already referred in these pages (Entom. xviii. 51) to the paucity or total absence of this bold *Vanessa* in many localities where it had at one time been abundant; as for instance about the chalk-pits and slopes of Kent. This year I have seen it between Gravesend and Dartford upon ground where I have sought vainly for it since 1879 or 1880.—J. R. S. CLIFFORD; Gravesend, Oct. 3.

COLIAS EDUSA AND C. HYALE.—A single specimen of *Colias hyale* was captured, settled on a flower in a garden at Warley, early in September; and *Colias edusa* was seen about the same date in that neighbourhood. *C. edusa* also occurred near Lyndhurst, in the New Forest, about the middle of August; and I myself in company with a friend took half a dozen specimens in half an hour near Yarmouth (I. W.). My brother, Rev. P. E. Raynor, who was staying at Budleigh Salterton, reported it as abundant there; and on my sending him twelve glass-topped boxes, promptly returned them to me with twelve live *C. edusa*. He also tells me he saw a specimen on the wing at Hazeleigh, in Essex. On the whole this seems to have been

a very fair year for *C. edusa*; but I do not hear of *C. hyale* being taken elsewhere, except at Warley; but perhaps some of your correspondents may have seen it.—(Rev.) GILBERT H. RAYNOR; Shenfield, Brentwood, November 9, 1885.

COLIAS EDUSA IN SUSSEX.—I took a very fine female specimen of this butterfly in a garden at Groombridge, on September 8rd; and on the 15th of the same month saw four specimens on the banks of a disused railway near the same village, some of which I captured. On the 18th I saw three more in the same locality. I also saw a remarkably large specimen in a rough field on the 23rd, but unfortunately had no net with me at the time. A friend of mine tells me he found this butterfly plentifully in a clover field at Frant, near Tunbridge Wells, about the end of August.—W. H. BLABER; Beckworth, Lindfield, Sussex, Nov. 13, 1885.

LYCÆNA CORYDON ON BARNES COMMON.—My son captured a male specimen in good condition of *L. corydon* on Barnes Common, near London, about the end of August last.—H. SHARP; 37, Union Street, Portland Place, W., Oct. 17, 1885.

DIMINUTIVE DIURNI.—Whilst in Dorsetshire, during the month of August, I noticed many more small forms than usual of *Epinephele tithonus* and *Lycæna icarus*; and also many amongst *Pieris brassicæ*, *napi*, and *rapæ*. The small specimens, however, of *L. icarus* were very frequent of both sexes,—the males being darker in colour than the full-sized examples,—and often not larger than *L. minima (alsus)*. *Colias edusa*, of which I saw many specimens from the sea-coast to as far as twenty miles inland, were not large specimens. Would the long period of dry weather have any effect in checking the full development of the imago?—T. B. JEFFERYS; Clevedon, October 24, 1885.

SPHINX CONVULVULI AND *CHÆROCAMPA CELERIO* IN SUSSEX.—I have taken this year *Sphinx convolvuli*, September 11th and a beautiful specimen of *Chærocampa celerio* hovering over phlox, at Firle, September 23rd.—DOVER C. EDGELL; Firle, Lewes, October, 1885.

SPHINX CONVULVULI AT BECKENHAM.—A fine specimen of *Sphinx convolvuli* was captured at Beckenham, on September 8th this year, by my sister, who gave it to me alive. I also captured a female specimen of *Colias edusa*, near the same place, three days later.—G. BAILEY; 6, Queen Adelaide Road, Penge, S.E.

ACHERONTIA ATROPOS AT BURTON-ON-TRENT.—On September 28th last I had a fine specimen of *Acherontia atropos* brought to me by a railway man, who found it on a truck at Branstone Junction, near this town. A few days before I had a pupa of the same species from a man who had been at work in a potato field. I have also heard of several larvæ being taken in and about the town this year.—J. E. NOWERS; Burton-on-Trent, Oct. 13, 1885.

ZYGÆNA FILIPENDULÆ var. OCHSENHEIMERI.—While looking over the collections at the late sale at Mr. Stevens's, I saw in one of the drawers of European Lepidoptera the variety of *Zygæna filipendulæ* named *ochsenheimeri*. I have taken it in the metropolitan district for several years, but never could find a name for it before. The difference in the variety is that the spot near the centre of the costa and the one nearest the tip are much smaller than in the type; also the green nervure cuts through the spot nearest the tip; and, what is more striking, it has a broader border on the under wing. The time of appearance is much earlier than that of *Z. filipendulæ*, as I generally take it in May. I have distributed a great many of them to several well-known entomologists, and do not suppose it is at all rare, but think it ought to be recorded. I have now placed the name to the series in my collection.—C. J. BODEN; 228, Bermondsey St., London.

ZYGÆNA FILIPENDULÆ IMPALED.—While collecting on the sand-dunes in Morte Bay I found a *Zygæna filipendulæ* impaled on a long spike of grass; it was speared through the abdomen from side to side, and very little damaged. I have the specimen, grass and all, in my cabinet.—F. H. PERRY COSTE; Tottenham, Sept. 17, 1885.

CALLIMORPHA HERA IN SOUTH DEVON.—Whilst staying at Dawlish last year, Mr. Brooks, whom I met by accident, informed me of his having taken several *Callimorpha hera* (Entom. xvii. 233). He showed me the exact locality; and this year I hunted the ground, in company with a friend from London, for that species, when, on August 24th, I was fortunate enough to capture a female specimen, the ground colour of the hind wings being yellow, like those of *Arctia villica*. In beating the high hedges of the neighbourhood I disturbed another *C. hera*, which, however, escaped.—J. JAGER; 180, Kensington Park Road, Notting Hill, W., November, 1885.

CATOCALA FRAXINI IN HYDE PARK.—I had the good fortune to capture a fine specimen of *Catocala fraxini* in Hyde Park on September 9th last. It was at rest on a tall sycamore near the Serpentine, thirty feet from the ground, and not being sure whether it was *C. nupta* or not I threw a handful of gravel at it. It fell at my feet, feigning death. A gardener had seen it two hours previously on an ash tree, but not knowing its value took no notice of it. I have no doubt it had emerged from the pupa in the immediate locality; it had apparently not flown far.—JOSEPH POTTER; 24, Henrietta Street, Brunswick Square, London, November, 1885.

LEPIDOPTERA OF DERBYSHIRE. — The lepidopterous fauna of the midland counties of England does not appear to have so much engaged the attention of entomologists as that of some other districts, and generally the impression prevails that they are somewhat barren of species and not profitable working ground for the collector. Some short notes of a sojourn therein, from 8th to 18th June last, may not be without interest. A considerable proportion of my time was not available for Entomology, and the weather generally was not favourable; but, in spite of these obstacles, I managed to take a number of, and some fairly good, species. I made the village of Little Eaton (three miles north of Derby) my head-quarters; the country round here looks very promising, the subsoil is chiefly gravel, and the district is noted for its quarries of freestone. The flora is very extensive, and many plants well known and valued by entomologists occur freely; this is particularly the case with respect to the food-plants of the *Eupitheciæ*, no less than twenty-six species of which genus occur within a radius of two miles. In front of my lodgings stretched Breadsall Moor, an elevated tract of country covered with heath, bilberry, &c.; whilst all round were fine woods of larch, fir, oak, &c., intermixed with beech, birch, alder, and a large growth of willow. I did not sugar, and chiefly confined my operations to day-work. Amongst the species I took were *Drepana falcataria*, *Eupithecia nanata*, and *Tephrosia punctularia* amongst birch. *Asthenia luteata*, *E. oblitterata* (*heparata*), and *Hypsipetes trifasciata* (*impluviata*) were common amongst alder; whilst in the neighbourhood of larch and fir *E. indigata* and *E. lariciata*, with *Macaria liturata*; fine forms of *Tephrosia biundularia*, dark as *Boarmia gemmaria* (*rhomboidaria*), occurred freely, and *Coccyx tædella* (*hyrci-*

nana) swarmed. On black poplar were to be found young larvæ of *Tæniocampa populeti*, and in one wood *Abraxas sylvata* (*ulmata*) were in profusion. On Breadsall Moor *Eupithecia nanata*, *E. minutata*, and *Anarta myrtilli* were common, and also *Phoxopteryx myrtilana*; whilst every sprig of bilberry was tenanted by a larva of *Grapholitha geminana*, and *Phycis fusca* (*carbonariella*) also occurred. Of general distribution were *Hadena glauca*, *Thyatira batis*, *Emmelesia albulata*, *Eupithecia pulchellata*, *E. pumilata*, &c. The larvæ of *Tethea subtusa* abounded on poplar all round the neighbourhood. I paid two visits to Repton; there *Lobophora halterata* (*hexapterata*), *Melanthia albicillata*, *Coremia designata* (*propugnata*), and *Phoxopteryx lactana* (*ramana*) were seen on the tree-trunks, the larvæ of *Cheimatobia boreata* were common on birch, and those of *Thecla w-album* on wych elm. The day previous to my return was spent at Lathkill Dale, a mountain-valley situated near Bakewell, and celebrated for its picturesque scenery. Seeing a wych elm here, I opened my umbrella and beat; down came quite a shower of larvæ of *Xanthia gilvago* and *X. cicellaris* (*ferruginea*); a little farther on *Nisoniades tages* was common. I stopped to examine a sallow bush; it was only a small one, and could have been covered with an ordinary-sized blanket, yet off it I took over 150 larvæ of *Cleocris viminalis*; these when bred produced some fine varieties, of all shades of colour from quite black to the ordinary light southern form. Up the sides of the valley the males of *Nemeophila plantaginis* were flying freely in the sun, and in company with them swarms of *Ino geryon*. I can confidently recommend this and other mountain valleys of the district to resident collectors; they have scarcely been worked, and, judging from the flora, many rarities must occur, especially amongst the smaller Lepidoptera. At any rate a day at Lathkill Dale is well spent, if only for the sake of its scenery, adorned by the mountain stream, clear as crystal, swarming with trout and grayling.—W. G. SHELDON; The Oval, Addiscombe, Croydon, October 14, 1885.

NOTES ON THE SEASON: EASTBOURNE; NEW FOREST; MALVERN.—In June and July last I made several trips to the neighbourhood of Eastbourne, Sussex, and met with fair success, as the following report will show. Among the Diurni I took, mostly in good condition, *Argynnis paphia*, *A. euphrosyne*, *A. selene*, *Melitæa athalia*, *Melanargia galathea*,

Pararge megæra, *P. egeria*, *Epinephele hyperanthus*, *E. tithonus*, and a freshly-emerged variety of *E. ianira*, in which the usual colouring of the male is replaced by a beautiful fawn-colour, but in other respects does not in any way differ from the typical male. *Thecla quercus* was in profusion round the oaks, but very difficult to obtain, owing to their unwillingness to descend within reach of the net. *T. rubi*, earlier in the season, was plentiful. I saw a fine specimen of *Limenitis sibylla*, which I believe is rare in this locality. By beating the underwood I procured *Angerona prunaria*, *Metrocampa margaritaria*, *Boarmia consortaria*, *Melanippe hastata*, and other common species. *Nemeophila plantaginis* was frequent in the clearings, as also was *Lithosia mesomella*, which I have not observed there before. Hybernated *Gonepteryx rhamni* and several of the Nymphalidæ (Vanessidæ) were commoner than usual. At the beginning of July I passed a week at Brockenhurst, where I anticipated, after the previous warm weather, that many of the forest species would be well out, but it was quite the reverse; for although the mornings were still bright and warm, yet one might stroll through many of the rides without seeing anything of more importance than a worn *Pararge egeria*. I was much surprised when I heard from Gulliver that neither *Argynnis paphia* nor *Limenitis sibylla* had been seen. However, after four days without any success as regards day-work, *A. paphia* turned up, but not in any abundance; *L. sibylla* also, but sparingly. Giving up the enclosures in disgust, my attention was turned to the heaths, where I disturbed *Lithosia mesomella*, *Euchelia iacobeæ*, *Nemeophila russula*, *Acidalia straminata*, *Aspilates strigillaria*, *Eubolia plumbaria* (*palumbaria*), and *Eupithecia nanata*. Neither *Selidosoma ericetaria* (*plumaria*), nor *Gnophos obscuraria* were discovered, although I worked hard for them. *Acidalia emutaria* occurred among other species in the bogs. The night-work as regards sugar was a total failure, but on several nights Geometers appeared in some numbers on the wing. I netted, among others, *Metrocampa margaritaria*, *Bapta temerata* (commonly), *Cleora lichenaria*, *Boarmia repandata*, *Melanthia albicillata*, with *Calligenia miniata* and *Cymatophora duplaris*. *Gnophria quadra* was again entirely absent; and only one larva of *Psilura monacha* discovered. I paid another visit to Stubby just before leaving, but, with the exception of *Epinephele*

hyperanthes, which was now emerging, no fresh species were met with. Larvæ beating, I may mention, was extremely unprofitable. The country in the Malvern district (Worcestershire) during the latter end of August was still more disappointing. The only species of Diurni seen were *Rhodocera rhamni* (one example), *Vanessa cardui* (one specimen), *Pararge megæra*, *Epinephele tithonus*, *Cænonympha pamphilus*, and *Hesperia thaumas (linea)*. I noticed a large number of Noctuæ on the wing at dusk, but they were of the very commonest species. One fact I think is particularly notable, and that is that I have not seen a single specimen of *Vanessa urticae* this season, either hybernated or otherwise. With regard to this neighbourhood I consider it a fair average year. I received, with several other good species, a very fine specimen of *Sphinx convolvuli* at the beginning of the present month; but, as far as my experience goes, the season of 1885 (up to date) has been a very little improvement, if any, upon the last two years. I hope to hear more encouraging reports from other localities.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., September 23, 1885.

LEPIDOPTERA IN S. IRELAND.—The past season has been, on the whole, very good in the South of Ireland, although some specimens were rather late. Numbers of hybernated *Vanessa io* and *V. urticae* appeared about April 18th, and on that day I first observed *Euchloe cardamines*. *Pararge egeria* did not appear till May 3rd. The common *Hepialus* was first seen by me in the long grass of the fields on June 5th. On June 14th, in the same wood in which I saw one last year, I caught three *Melitæa aurinia*. This wood is quite dry, and I have ceased to believe moisture to be a requisite for this species. The common *Ino statice* was swarming at this time in the same place, looking like green flies when on the wing. On June 16th I went to the same place, but, although the day was very fine, I could not discover a single *M. aurinia*. I was, however, rewarded by a splendid *Macroglossa bombylifformis*. I missed it at first, but managed to catch it a quarter of an hour afterwards. *Venilia macularia* was now seen in great profusion, and *Hepialus humuli* was a perfect pest. *Zygæna filipendulæ* was also very common, and at night I caught *Plusia gamma*, *Acronycta psi*, *A. euphorbiæ (myricæ)* and *A. rumicis*, *Hadena oleracea*, *Mamestra brassicæ* and *M. persicariæ*, *Abrastola urticae*, and *Rumia cratægata*; while among the Bombyces were *Hepialus velleda* and

H. lupulinus, *Diloba cæruleocephala*, *Dicranura vinula*, *Arctia caia*, *Spilosoma menthrasti*, *S. lubricipeda*, and many other common moths. Sugar was quite a failure. The best plan for taking Noctuæ was to catch them with a net and lantern. I was over in England from July 10th till August 12th, but when I returned the country was swarming with *Colias edusa*. We always noticed that they were to be met with in most plenty at the sea-side. Although the Vanessidæ were as numerous as ever, I have not seen *Macroglossa stellatarum* once this year, though they were plentiful last season. By the above list it will be seen that what there are in Ireland are abundant, but the number of species appears to be very limited.—HARRY C. SANDFORD; Bellevue Park, Military Road, Cork, September, 1885.

MELANISM IN RENFREWSHIRE.—Having received remarkably black forms of *Thera variata* from my friend Mr. Watson, of Renfrewshire, I determined to visit his locality this year, and started on the 13th September. This journey was not unaccompanied by adventure, for on account of their being two stations of the same name, but on different lines, out of Glasgow, my wife and I found ourselves late at night in a most lonely locality, and utterly lost. At length, through the kindly hospitality of a Mr. Young, who most good-naturedly helped us out of our difficulty, we reached our destination. I found, with Mr. Watson, some most lovely forms of black *T. variata*, also *T. firmata* and worn *Retinea turionana*; some very black. Among the Lepidoptera Mr. Watson had saved for me were some most extraordinary varieties of *Cidaria immanata*: part of these were of the Arran, while others were like the Shetland, types. I never saw a more mixed series. *Hypsipetes trifasciata* (*impluviata*) are most variable, and in a novel radiating manner: some are so black as to be steel-blue in ground colour, with a chain-like row of white spots on the margin; others have the same ground colour, with a band of bright brown in the anterior wings. The May brood of this species are much larger than those of September in that locality. *Melanippe montanata* occurred, some of which were of the Shetland form; while *Melanthia bicolorata* (*rubiginata*) are of the Rannoch type. There is an *Eupithecia* in the wood, but the specimens are so black that one cannot make out the species. The *Oporabia dilutata* of the district are also very dark. I observed no undergrowth in the wood, though outside there was heath.

My friend Mr. Watson tells me that this locality, which is about ten miles from Paisley, is the only remaining bit of "virgin soil" in the Clyde Valley. Certainly the aptitude to melanism among Lepidoptera is remarkable; and a series of such *T. variata* as we took is well worth all the journey and trouble to see.—J. B. HODGKINSON; Fishergate, Preston, Sept., 1885.

RETARDED APPEARANCE OF LEPIDOPTERA.—With reference to Rev. J. S. St. John's note on *Asthena blomeri* (Entom. xviii. 263), during the past season certain species have been very erratic in the time of their appearance. Thus *Thera variata*, which I observed early in June in Derbyshire, has been common at West Wickham up to September 26th, when it was abundant and in fair condition. *Argynnis aglaia* was just coming out near Dover on August 1st (quite a month late). Autumnal larvæ in this part of Surrey are very backward; I have *Eupithecia pimpinellata* still quite small; these I usually take full-fed about September 10th.—W. G. SHELTON; The Oval, Addiscombe, Croydon, Oct. 14, 1885.

RETARDED APPEARANCES OF LEPIDOPTERA.—On June 23rd, 1879, I found, at Burghclere, a nest of larvæ of *Eriogaster lanestris*, which made their first appearance from pupæ in successive years, as follows:—1880, none; March 6th, 1881; January 1st, 1882; March 3rd, 1883; April 2nd, 1884. On April 18th, 1882, I obtained some ova of *Endromis versicolor* at Andover, the imagines of which (many larvæ having died about full-fed) made their first appearance on April 1st, 1883; March 22nd, 1884. In July, 1882, I found a larva of *Dicranura vinula*, which remained in pupa till May 20th, 1884.—(Rev.) C. A. SLADEN; Burghclere, Newbury, October, 1885.

EGGENTRIC APPEARANCES OF LEPIDOPTERA.—On August 3rd, 1883, I caught *Pterostoma palpina* at light; August 11th, 1885, I caught *Hepialus lupulinus* at light; September 8th, 1885, I bred *Dianthæcia capsicola* from larvæ of the year, the only one of several dozen that thus emerged.—(Rev.) C. A. SLADEN.

ERRATIC APPEARANCE OF LEPIDOPTERA.—I have now, October 17th, a larva of *Plusia iota* just turning to pupa; larvæ of *Vanessa atalanta*, varying in length from three-fourths of an inch to full-fed, and four just turned to pupæ; *Eugonia quercinaria* (*angularia*) now emerging, though some were bred two months ago. A female *Amphydasis betularia* deposited a brood of ova only three weeks

ago, so if the larvæ do not make haste they must either hibernate or starve. These pupæ of *V. atalanta* must either die or remain so over the winter, which suggests that many of the very fine *Vanessidæ* found in spring may have passed the winter in pupa state, and not hibernated as imagines.—H. SHARP; 37, Union Street, Portland Place, London, October 17, 1885.

PERFORATED OVA OF LEPIDOPTERA.—I discovered last year that the eggs of *Dicranura vinula* are perforated at the apex by a small orifice, which apparently penetrates through the outside shell, but is covered on the interior of the shell by a thin membrane, resembling that which is found in the eggs of domestic fowls, &c. Though I mentioned the fact at the time to several entomologists, no one seems to have noticed it; so I carefully noted the discovery, and determined to publish it on the first opportunity. I should be much obliged if any entomologist would let me know whether the eggs of *D. bifida* and *D. furcula* are similarly perforated.—CYRIL B. HOLMAN HUNT; Draycott Lodge, Fulham, S.W., November 9, 1885.

URTICATION BY LARVÆ OF BOMBYX RUBI.—I have just seen a case of urtication caused by larvæ of *Bombyx rubi*, a number of which have been brought to me by a friend from Devonshire. His hands are covered with small white blisters, and he suffers from inflammatory swelling upon them. This is the first case I have noticed of this species causing this irritation. The effect seems to vary with different individuals, for some seem very sensitive to the urticating power of the hairs, though I have never experienced it, and, so far as I can judge, it has no effect upon me.—H. SHARP; 37, Union Street, Portland Place, London, W., October 17, 1885.

SOUND-PRODUCING LARVÆ. — In reply to Mr. Clifford's question, "Can the larva of *Acherontia atropos* produce a sound"? (Entom. xviii. 301), I can most confidently assert—for I have heard them myself—that the larva, pupa, and imago of this moth have *all* the power of doing so. The noise made by the larva is a kind of snap, exactly resembling the *electric spark*. In the case of the pupa and moth it is nearly identical, though in the pupa somewhat fainter, and is a shrill, grating squeak, not unlike that of the dolls which, upon being squeezed, give forth a cry. How this sound is made is still a moot point. I cannot for a moment entertain the idea that the squeaking

appears to be connected in some way or other with a small membranous capsule, which is situated on either side of the body at the base of the abdomen, and which is covered with some hairs, which can be made to vibrate. I am convinced that the squeaking of the moth is connected with the proboscis, for when holding them in my fingers by the base of the wings, prior to chloroforming them, and they have been squeaking loudly, expressing apparently their disapproval of the retention, the instant I pressed the tongue the sound ceased. I have to-day (November 5th) been experimenting with an uncommonly noisy specimen recently emerged, and am certain that *it is by the proboscis that the squeaking is produced*. This may be confirmed also by holding the moth to the ear whilst it is emitting its cries, when it will be at once detected that it is from the mouth that they proceed. But though the tongue may likewise be the organ of the sound emanating from the pupa, I am at a loss to understand the way in which it is made by the larva.—JOSEPH ANDERSON, jun.; Chichester, November, 1885.

RELATION BETWEEN BRITISH AND JAPANESE INSECTS.—At a recent meeting of the Asiatic Society of Japan (reported in the 'Japan Mail'), a paper, by Mr. H. Pryer, was read on the relation between the Lepidoptera of Great Britain and Japan. From the statistics given it appears that about 16 per cent. of the British species are found in Japan. At first sight there does not seem to be any strong resemblance between the Japanese and British specimens of certain species; but the differences are demonstrably due simply to the effect of temperature. In Japan the temperature forms are very numerous, because of the fluctuations in temperature which are so peculiar to the country. When the great distance separating the countries, and the striking climatic differences are considered, the identity of such a large percentage of species is a fact of the highest interest to the entomologist.

ECONOMY OF GEOTRUPES STERCORARIUS.—I observed that only a few straggling specimens of this beetle were to be seen this summer, until the break-up of the drought in August, when the insects appeared numerous. It may be assumed, therefore, that most of them were earth-bound, and unable to work up to the surface till the soil was loosened by rain. No beetle, I believe, is so

frequently to be found along roads and pathways at early morning, not because it has chosen such places for its perambulations, but having fallen there during the night it has been vainly trying to mount again in the air, which is matter of difficulty, even when it has mounted a twig. This beetle, though rapid in flight, is yet singularly awkward, hence soon thrown to the ground by any obstacle, and on *terrâ firmâ* its movements by day are very slow; possibly, in some cases, this arises from exhaustion, caused by the number of *Acari* that are adhering to the abdomen and legs. It seems to be *Gamasus marginatus* that chiefly plagues the "dor," or, as certain country folks name it, the "lousy watchman;" from this very circumstance, not "drowsy," I think, as it is oddly stated in some books. I have never discovered these *Acari* upon the beetle in any stage but their adult one, so that their early life is passed elsewhere. The author of the valuable monograph of the British Aptera does not elucidate this portion of their history for us; but it is not likely they are vegetarians even when young.—J. R. S. CLIFFORD; Gravesend, October 3, 1885.

APANTELES GLOMERATUS, L.—*Apanteles glomeratus*, the parasite of *Pieris brassicæ*, is common enough; but the following notes, as to the period of its oviposition in its host and the statistics as to its numbers, may interest some entomologists, as they have interested me. On July 14th I sent a friend a batch of young larvæ of *Pieris brassicæ*, some moulting for the first time, others through the moult two or three days. On July 29th I received a letter from him saying that nearly the whole of them had produced parasites (*Apanteles glomeratus*); this rather surprised me, seeing that the larvæ were so young when taken. On September 2nd I was passing the same garden, and observed a batch of forty caterpillars close together, about to change their skins for the first time. I thought this was a good opportunity to verify my friend's statement, consequently the cabbage-leaf with the young larvæ was duly transferred to my breeding-cage; and on the 23rd following I saw that thirty of them had produced parasites (*A. glomeratus*), and ten had changed to pupæ. Thus I was able to confirm his remarks, and am exceedingly glad to have done so, for I must say I was at first rather sceptical over the matter. The parasites averaged about forty-five to each larva. To-day I found in the garden a larva with ninety-nine cocoons of

A. glomeratus under and around it; and I think the greater number may be accounted for by supposing that the parent parasite attacked this larva when further advanced in growth, and consequently stronger and better able to support them. It seems curious that a larva some four mm. in length should have about fifty eggs of its enemy lodged in it.—G. C. BIGNELL Stonehouse, September 24, 1885.

MICROPLITIS OCELLATÆ, *Bouché*.—Mr. Charles Fenn very kindly sent me a *Smerinthus populi* larva, from which sixty-two *Microplitis ocellatæ* had issued. This, I believe, is the greatest number yet noted of this species from its victim.—G. C. BIGNELL.

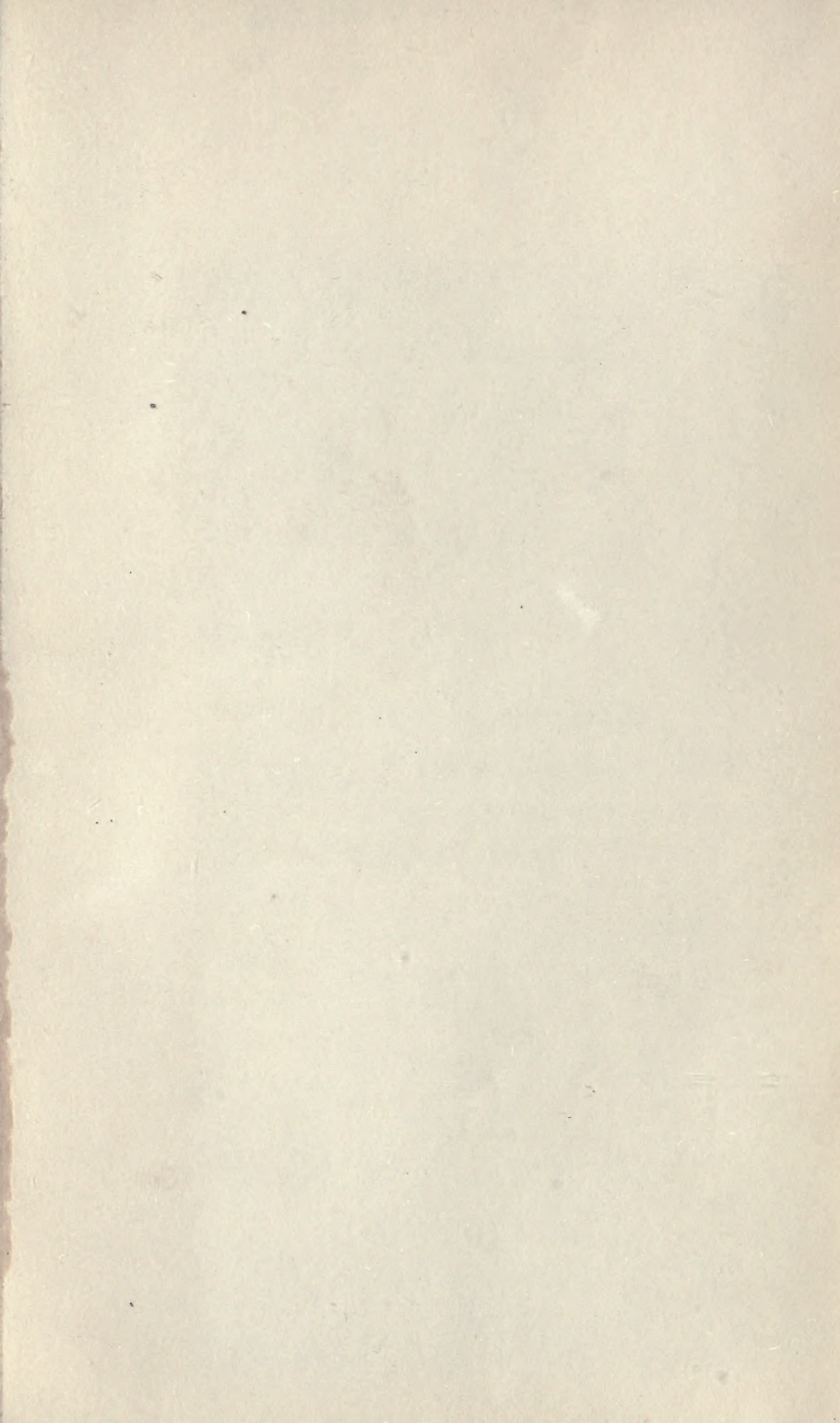
THE MIGRATION OF APHIDES.—Probably at no place in the country were the swarms of migrating Aphides more dense this year than at Emsworth, in Hampshire. In such profusion were these insects that they seriously interfered with the traffic in the streets. They seem especially to have beset the Post-office, making it difficult for the officials to conduct their business, their noses, eyes, and ears being almost filled with them.—JOSEPH ANDERSON, jun.; Chichester; November, 1885.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—The Annual Exhibition of Insects in Pocket-boxes, held by this Society, occurred on Thursday, November 12th, and was very successful, a large number of members and visitors being present. The exhibits were fairly numerous and interesting; among others were those of the following:—Mr. Thornthwaite, fine *Sphinx convolvuli*, and a very perfect specimen of *Chærocampa celerio* from Lynmouth, Devonshire, with many other insects in fine condition. Mr. H. Jobson, fine *Plusia chryson* (*orichalcea*), and a series each of *Erastria venustula*, *Bankia argentula*, and others. Mr. E. Cooke, a fine series of *Acronycta alni*, varieties of *Arctia villica*, having the spots on the anterior wings confluent, and a nice series of *Eupæcilia curvistrigana*. Mr. Franklin, life-histories of several species; but the best exhibit of this kind was Mr. Pearson's case, containing twelve species, all most carefully worked out and arranged, the ichneumons being included. Mr. Anderson showed two boxes containing preserved larvæ. Mr. Gray, of Redhill, some recently captured specimens. Mr. Russell, a fine "IVI" variety of *Setina irrorella*, a peculiar sandy yellow form of *Melanippe fluctuata*, and others. Mr. Hockett confined himself

to one species, showing a graduated series of varieties of *Abraxas grossulariata*. Mr. Harper, varieties of *Spilosoma lubricipeda*, *Eugonia quercinaria* (*angularia*), *Moma orion*, *Lælia cænosa*, *Cleora angularia* (*viduaria*), &c. Mr. J. A. Clark, a specimen of *C. celerio*, captured in Hackney; also varieties of female *Lycæna corydon*, and a living specimen of *Acherontia atropos*. Mr. J. A. Cooper, series each of bred *Zonosoma orbicularia*, *Z. porata*, and *Pericallia syringaria*. Mr. Gates, light and dwarf varieties of *Arctia caia*. Mr. Gurney, a beautiful dark suffused specimen of the same species. Mr. Allbuury, confluent var. of *A. villica*, *Scoria lineata* (*dealbata*), *Cnæmidophorus rhododactylus*, and *Ocneria dispar*, taken this year at Bexley Heath. Dr. Sequeira, selection from his Devonshire captures, including some splendid forms, *Hypsipetes elutata*, &c. Mr. Pearson, Coleoptera, comprising *Rhynchites pubescens*, and species of Coccinellidæ. Mr. Cripps, *Donacia menyanthidis* and *D. typhæ*; also female *Athous longicollis*, four species of Coccinellidæ, *Plagioderma armoraciæ*, *Pterostichus lepidus*, &c. Mr. G. A. Lewcock, *Necrophori*, *Donaciæ*, *Saperda carcharias*, *Grammoptera tabacicolor*, *Leptura livida*, *Gymnetron*, *Sibynes*, *Hypna*, *Tanymecus*, *Cleonus nebulosus*, *Bembidia*, &c.; all remarkable for their careful mounting and neatness of arrangement. The visitors made considerable additions to the exhibits. The centre of interest throughout the evening was Mr. B. W. Neave's variety of the under side of a male *Lycæna alexis*, captured on Brighton Downs; this beautiful specimen has a series of long dashes most regularly arranged in place of the usual spots. Mr. Hawes, male *Argynnis paphia* much streaked with black, and bleached forms of *Epinephele ianira*. Mr. Riches, a suffused *Hemerophila abruptaria*, taken at Hornsey Rise. Mr. Adkin, very dark forms of *Dianthæcia capsophila*.—ERNEST ANDERSON, Hon. Sec.; 10, Brownlow Street, Dalston, E.

NATURAL HISTORY EXHIBITION.—The South London Society will hold its Annual Exhibition, of which entomological subjects will form a large section, at the rooms, 1 Denman Street, adjoining London Bridge Station, on the 3rd inst., at 8 o'clock p.m. These exhibitions deserve the patronage of our readers, and greatly encourage the interest taken in Natural History work generally.—J. T. C.

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